Garden Profits

Goshen College
Library

GARDEN PROFITS

BIG MONEY IN SMALL PLOTS

However you look at it—whether from the point of view of economy, duty, health, enjoyment, better living or deserved reward—the advice is still the same; *you should have a garden*

Garden Profits

BIG MONEY IN SMALL PLOTS

By
E. L. D. SEYMOUR, B. S. A.

ILLUSTRATED

Published by
DOUBLEDAY, PAGE & COMPANY
GARDEN CITY, N. Y.
1913

Goshen College
Library

80

Copyright, 1911, by
DOUBLEDAY, PAGE & COMPANY

SB
321
S5

1395 6

ACKNOWLEDGMENTS

In the following pages the keynote is experience. The results stated, the methods suggested, the varieties advised — all are the results of actual, sincere experience. For it is by such means that the uninitiated can be really assisted and given practical, usable directions towards success.

Whatever matter I have quoted has been generously offered by its originator or discoverer, with the idea of helping his fellow gardener. Personal experiences, individual results, original ideas, have been submitted that the success that followed them might be shared, not monopolized. It is in this spirit of common interest, that of a member of a fraternity of tillers of the soil, that I acknowledge the assistance I have received. I wish to mention especially "The Vest-pocket Garden Record System," devised by Mr. J. L. Kayan; and the details of coldframe management supplied by Mr. George Standen. For much of the material for Chapter V. on "A Year's Cycle in the Garden," I am indebted to Mr. William C. McCollom, for his articles on the seasons' work in the vegetable garden. The tables in Chapter VII. on the insects and diseases of plants is the work of Dr. E. Porter Felt, State Entomologist of New York; and the methods of mixing spray materials in small quantities were worked out by Mr. W. C. O'Kane.

In conclusion, I acknowledge the assistance rendered by *The Garden Magazine*, from which I have obtained numerous ideas and valuable data.

E. L. D. S.

Garden City, N. Y., February, 1911.

CONTENTS

CHAPTER I

PAGE

THE SELF-SUPPORTING HOME 3

Intensive vs. Extensive Culture 6
The Danger of Undercapitalization 7
The Consumer Coming Into His Own 9

CHAPTER II

MONEY IN THE BACK YARD 10

How To Make Twenty-four Tomato Plants Hand You Fifty Dollars 11
Does Hoeing Pay? Well, Rather! 14
What a Garden Did for an Invalid 14
A New Kind of Economy in the Garden . . . 16
Plant Early and Smile at Your Neighbours . . 16
The Versatile Hotbed 17
Growing Plants in a Chicken Brooder 18
Hotbed Results — Without a Hotbed 19
How to Grow Vegetables Before You Plant Them . 19
Modern Success — With Old-fashioned Methods . . 21
Getting Better Seed 21
The "Best" Potato and How to Obtain It . . . 22
It's Never Too Late to Garden 23
A Garden Planted After the Fourth of July . . . 23
Discovered! The Real Use for a Back Fence . . 29
One-fifth of a Ton of Tomatoes from 300 Square Feet of Ground 31
Getting Along Without Manure 31
Making Tomato Plants Perennial 33
Making Your Own Springtime 33
How to Double the Cabbage Crop in Yield and Quality 33

CONTENTS

CHAPTER II — *Continued*

PAGE

The Two Greatest Garden Problems — and Their Solution 34
Double the Usefulness of the Clothes Pole — and Beautify It 34
A Welcome for Poultry in the Garden 35
The Secret of Successful Gardens 36
Commercial Methods Worth Copying 37
Overtime Growth in the Strawberry Bed . . . 38
Barrels of Strawberries! Doing Away with Plowing, Cultivating and Mulching 39

CHAPTER III

Successful Gardens You Can Have 43

Twelve Hundred Per Cent. Profit from 20 x 27 feet of Ground 43
Bean-strings — Cheaper and Simpler than Poles . . 46
Expenses One Dollar, minus; Returns, Fourteen Dollars, plus! 48
What Science Has Done for the Gardener . . . 49
The Redemption of a 28-foot Square Back Yard . 49
What the Square Yielded 53
What One Woman Can Do With Ten Dollars . . 54
Suggestions Worth Money 58
A Practical Working Calendar 59
Tales of Three Gardens and Three Hundred Dollars 64
What the Man "Without Any Time" Can Do . . 64
A New Chapter in the "Book of Friendship" . . 65
Transplanting — One Way to Save Space . . . 68
A Ten-Minutes-A-Day Garden 68
Five Crops on One Foot of Ground 70
What Your Garden Can Grow 73
Combining Succession and Rotation 79
Exploring the Unknown — A Plea for Unfamiliar Vegetables 85
Boys — and Girls — and Gardens 85
A Fourteen-Year-Old Boy's Garden That Produced Seventy Dollars 86
The Thorough Gardener and His Reward . . . 90

CONTENTS

Chapter III — *Continued*

PAGE

The Need of Garden Records 91
Can You Devise a Better One? 91
A Vest-pocket Garden Record System . . . 92
Early Plants Without a Hotbed 96
Big Returns from Eight Dollars 98
Cutting Down Seed Expense 98
More Than Six Hundred Per Cent. Returns . . 99
How to Make the Garden Plan Practical 99
Complete Cultural Directions in Tabular Form 100–104

CHAPTER IV

Getting the Most Out of Frames and Hotbeds . 105

The Difference Between "Coldframes" and "Hotbeds" 106
How to Build a Hotbed 107
A New Method for Hardening Hotbed Plants . . 110
Hotbed Mats 111
A Home-made Straw Mat 111
Building the Coldframe 114
The Entire Management of a Coldframe 116
Preparation. Sowing. Ventilating. Watering. Transplanting. Hardening off. Lettuce. Tomatoes. Peppers. Beets. Carrots. Eggplant. Onions. Leeks. Beans. Parsley. Spinach. Celery. Cauliflower. Cabbage. Peas.

CHAPTER V

A Year's Cycle in the Garden 133

The Planning Season: December to February . . 133
January.— The Garden Plan. Some General Advice. Seeds and Yields for a Definite Area. Transplanted Vegetables. When, Where and What to Transplant. Catalogues and Seedsmen. Good Seed. Kinds and Varieties. Keeping

CONTENTS

CHAPTER V — *Continued*

PAGE

Seeds. Tools and Repairs. Other Odd Jobs About the Garden. Manure. The First Planting. For the Fruit Garden. Special Requirements.

February.— Hotbeds. The Growing Plants. New Plantings. Fruitward Thoughts.

The Season of Planting: March to June . . . 150

March.— Planting and Transplanting. Moving Last Month's Seedlings. Just How to Transplant. "Dibbling." Paper Pots. The First Potatoes. Making an Asparagus Bed. Advice for the Future. Rhubarb Beds, too. Getting the Ground Ready. Clay Soils. The Seed-bed. Planting the Fruit in the Garden. Tree Fruits. Grapes. Bush Fruits. Strawberries.

April.— The Value of Manure. The Principles of Seed Sowing. Drilling. The All Season Crops. Sowing for Succession. Corn.

The Busy Growing Season: May to October . . 170

May.— The Main Corn Crop. Melons and Lima Beans. Pumpkins, Squash, etc. New Zealand Spinach. More Succession Sowing. A Rule for Succession Crops. Setting Out the Tender Plants. Fall Crops. The Asparagus Bed. "To Hill or Not to Hill." Thinning Out. Fruit Notes. The Growing Season for Fruits.

June.— A Washing Tank for Vegetables. When to Gather Vegetables. Special Care for Melons. Supporting the Tomato Vines. Looking Out for Insects. Water and Fertilizer. Fruits.

July.— Fighting the Heat and Drought. Late Transplanting. Celery Care. Don't Forget the Asparagus Bed. Ripening and Picking Melons. What to Sow in July. Thinning Fruit. Bag the Grapes. Keep Up the Cultivating. Pruning.

CONTENTS

CHAPTER V — *Continued*

PAGE

August.— Blanching Celery With Boards. The Hilling Method. Keep the Celery Growing. Seeds for Present Sowing. Do You Know a Ripe Watermelon? Harvest the Onions. Begin to Save Manure Now. Putting the Fruits to Sleep.

September.— Plan Improvements. Fall Sowings. The Handmarks of a Careful Gardener.

October.— Cover Crops and Insects. Getting the Best of the Early Frosts. Keeping Celery Outdoors. Storing Roots.

The Quiet Season: November 207

November.— Storing Celery for Winter. The Celery Trench. In the Very Small Garden. A Good Time to Fight Cutworms. Mulching Strawberries. Tender Varieties of Brambles. Apples, Pears, etc.

CHAPTER VI

The Simplicity of Self-Maintaining Fertility That Everyone Can Have 214

Plant Food That Never Runs Out 215
The Greatest Secret of All 216
What Certain Plants Like Best 217
Fertility that Every Garden Can Have 218
Available Manure for Every Small Garden . . . 219
The Simple Art of Using Manure 220
Saving Manure = Saving Money 221
Concentrated Plant Food for Small Gardens . . . 222
How Much to Use 222
Some Very Cheap Fertilizers 225
Manures That You Don't Have to Buy . . . 226
The Secret of Unending Fertility 227
Killing the Soil Robbers 228
"Simplicity" 228

CONTENTS

CHAPTER VII

PAGE

What Ails Your Plants? 230

How to Make Spray Mixtures 231–240

Bordeaux Mixture. Ammoniacal Copper Carbonate. Formalin. Arsenate of Lead. Kerosene Emulsion. Tobacco Water. Soap Solution. Pyrethrum. Poisoned Bran Mash. Combined Mixtures.

What Bothers the Small Fruits 241

The Worst Pests of our Orchard Trees . . . 242–243

For the Vegetable Garden. 244–245

Glossary of Special Terms . . . . . .

Index . . . . . .

GARDEN PROFITS

BIG MONEY IN SMALL PLOTS

GARDEN PROFITS

I

THE SELF-SUPPORTING HOME

THERE'S money in *your* backyard. Perhaps you thought there was only a varied collection of rubbish, weeds and unsightly mud, and no particular hope for anything else. Or, if you *are* a bit neater and more particular than the majority, it may have meant a smooth grass plot, dotted with clothes poles, perhaps relieved by a flower bed or two.

But have you ever thought that *every square foot of that ground is worth money to you?* Dollars and cents? Vegetables and fruits for your own use and for sale; fresh, tender, delicious, and instead of your paying the grocer for them, they are bringing *you* a profit? Moreover, there is health waiting to be dug out of the ground; an appetite and a means of satisfying it! A prescription, and the medicine with which to fill it—that's the kind of a doctor to have, especially when his pills don't have to be sugar-coated.

In lifting from the backyard the familiar but

wornout ban of uselessness and ugliness, I do not claim to advance any wonderful new scheme, to disclose a "marvellous secret of success" (for which I charge one dollar), or to convey an infallible means of making a fortune in six months. The reported fabulous returns from such crops as ginseng are rarely, if ever, actual, and at best, success in such cases depends upon an uncertain market thousands of miles away. But vegetables and fruits are staples; they find markets everywhere, while guaranteed freshness and quality, contrasted with the doubtful, wilted store produce, are at a premium even in the height of the growing season. It is often possible to arrange for an exchange of goods — especially if you are within reach of the typical village "general store." Even the actual financial gain is intensified when we can deliver peas, beans or corn, which it has given us only pleasure to raise, and receive in return groceries, meat and the like, without having even to mention the inflated price of beef and the increased cost of living. In fact, for the owner of a small garden, there need be no such thing as "increased cost," for the soil grows ever more generous under care and attention, and with proper precautions can be made to yield not less, *but more and more with each succeeding year.*

Therefore, while I do not wish to mislead any reader into expecting an independent fortune from the backyard, yet I do maintain that there *is* such a thing as making a few hundred feet of soil produce money. Not a few of the (literally

speaking) "wise ones" have already done this, and if you have the "push," the common sense and the "wide-awake-ness" that go with a love for seeing and *making* things grow, why you, too, can begin to reap the reward, and become one of those "lucky fellows."

Don't for a minute think that your yard is too small, or, because the grass has been trampled out of sight and swamped with ashes, that the real live soil isn't there. How about the girl who planted a few cents' worth of seeds and raised enough plants to brighten her summer just about 99 per cent. on a hole in the ground, six feet long and eight feet wide! Another plant lover had to fight against a brick paving and won out by making portable flower beds from boxes and old tin kettles! Think of the householder who used the winter's accumulation of ashes to fill up a ravine back of his house, then, in the quarter-acre of soil on top, raised $100 worth of vegetables. There are a good many such cases, bits of which I shall cite now and then later on, but of which the whole story has been saved every time, with a record of the actual cost, the exact returns, and even, at times, the number of minutes spent each day, cultivating, watering — *and* harvesting the crops.

Another objection that you may try to raise is that you've "never done any gardening." Perhaps, in your frankness, you will declare that you don't even know how vegetables look, growing, nor when you ought to pick them. Well, that was the way with some of the others, and *they* suc-

ceeded. Moreover, in the following pages you will find a detailed account of the work that should be done every month in the year, where to do it, how to do it, and what to do it with. We have been gathering information and data from complete accounts, also discovering labor-and-time-saving methods, with this book in mind. If you keep these directions before you, you will be able to see at a glance just what is to be done, and the quickest and best way to do it. And you can *dig money out of your backyard!*

INTENSIVE VS. EXTENSIVE CULTURE

There is, in the records of gardening experiences, to which I refer, not only optimistic reference to success under seeming difficulties, but also the foundation of actual sound agricultural and economic principles. Intensive cultivation has been heralded as the coming salvation of the agriculture of the crowded East. There is not a little to be said in its favor.

Intensive cultivation is the practice of working *all* the land *all* the time; making every inch play its part, and letting no space remain uncropped. This is accomplished by: (*a*) succession planting, (*b*) companion planting, (*c*) training, and (*d*) the growth of green manure crops when nothing else can be cultivated. It is the logical means of making the land permanently fertile, which in one form or another is practiced on every successful farm of whatever size.

THE DANGER OF UNDERCAPITALIZATION

One of the commonest reasons for failure in farming is undercapitalization. With insufficient capital the farmer is compelled to buy on credit — paying, thereby, perhaps 50 per cent. more than the market price; he has too few tools, too little stock, and is forced to merely half-work his land — which is practically as expensive and only about one-fourth as profitable as *thoroughness*. The available capital may be used up on one crop of potatoes, corn or fruit, while many other acres of good land must be left idle — probably without even the beneficial effects of fallowing provided for by previous plowing.

Of course the amount of money representing undercapitalization is entirely relative, depending on the size and nature of the farm or garden. But here is the very backbone of the matter — *the smaller the (farm or) garden, the smaller the probability of undercapitalization*, and, as a result, the greater the relative returns. A half-acre garden, given intensive, continuous care will prove more profitable than several acres only partially cropped.

It will be possible to keep every foot at work, for there will not be the necessity of waiting for a whole crop, occupying one or more acres, to be removed, before another can be sown. In the small garden, where vegetables are grown in rows, one planting — representing at most three or four rows — can be harvested, the ground manured and cultivated, *and another crop planted, all in one day*, with not an hour's delay. Or, more in-

tensive still, as quick as one carrot, head of lettuce or cabbage is removed, another can be transplanted from the hotbed or frame, so that the soil will actually *never* be idle. In a small garden, the work will be personal, individual; every detail will be within reach, and the facility for observation and experiment, essentials to success, will be concentrated, localized, increased to the maximum. The labor item is extremely important, for with intensive cultivation or market gardening in mind, the necessary number of men and teams per acre increases entirely out of proportion to the acreage involved.

Finally, the matter of yields and profits is closely associated with the amount of land tilled. Theoretically the statement is true, that if half an acre will yield 250 bushels of potatoes, ten acres will yield 5,000 bushels. But this result requires that the soil and moisture conditions, the fertilizing, spraying and care, increase proportionately. In most cases this is impossible. It is comparatively simple to spade five or more tons of manure into half an acre, and be able to feel that the soil is in perfect tilth; it is another thing to apply 100 tons to 10 acres and bring the land to exactly as good condition. Five hundred and forty square feet of garden were cared for by a business man in his free moments, and with a cash outlay of $1.15, yielded $14.50 worth of vegetables. This is over 1200%, and a fact! It is difficult, if not absurd to think of a 1200% profit from even a two-acre farm.

THE CONSUMER COMING INTO HIS OWN

It is time that the consumer were given advice that will enable him to reduce his expenses. The doctrine now being preached to the farmer urges high-quality crops, advertising, high-class trade and *private markets*, whereby the high prices that the city people are willing to pay, need not be divided (equally?) with the various middlemen. Our message is straight to those city and suburban consumers themselves, that they *need not pay the high price to anyone*, and can at the same time obtain better food and often *pay themselves a cash profit*, by getting a large part of their living directly from the ground.

As far back as 1866 Peter Henderson stated that "the consumer pays twice the price the raiser receives." Don't you appreciate the advantage of being both consumer *and* producer? This sounds radical, perhaps; as if we were levelling hopes of destruction at the practical farmer and market gardener. However, neither is this our attitude, nor would it be the result. The stage of overproduction of food-stuffs has not yet been reached, nor is it likely soon to be, and there is no danger that there will not remain the necessary consumers— who are contented to remain as such — to make market-gardening profitable. To these we do not urge these methods, this system of home-profit making, but rather to those who are ambitious for something more; who want fresh, palatable vegetables and fruits, and the minimum expense in procuring them; who love the out-of-doors; who will find pleasure as well as profit in pursuing the oldest activity in the world.

II

MONEY IN THE BACKYARD

I MIGHT already have said that this is not to be the ordinary kind of "garden manual" for the amateur. Such texts often remind me of the criticism raised by the housekeeper of moderate means, upon reading a comprehensive cookbook. "It's all very well," she said, "for them to direct you to 'take a tender, two-inch beefsteak,' or 'prepare a fat, young broiler,' or 'beat up the whites of eight eggs,' but in these days of five-cent eggs and two-dollar chickens, it would be much more to the point if they told you where you were to 'take' them from." In the same way, I always feel a desire to ask the author of a treatise on fruit-growing, who starts off with "in planning for a home orchard, choose a slightly rolling, well-drained area, preferably sloping to the south, with a deep, loose soil not too heavy, underlaid by a gravelly clay subsoil, and within easy hauling distance of the barnyard and railroad"— I always want, I say, to ask him what we are going to do if such a piece of land is not on our farm to choose, or whether we had not better take our neighbor's front lawn, which seems to answer the requirements. In a very

few cases it might be justifiable to advise not setting the orchard at all. But in general I would say, as I do to the owner of a somnolent backyard "Go ahead anyway, start your garden as if every condition were favorable, and at the same time do everything you can to better conditions and to plan your work so that you gradually improve the soil, your health, your financial condition and your self-respect simultaneously."

That there is some chance of your benefiting from such advice is pretty definitely proven by the experience of a real amateur who realized some ideals in spite of unattractive conditions. Her own words tell an interesting and encouraging story.

HOW TO MAKE TWENTY-FOUR TOMATO PLANTS HAND YOU $50

"In a plot less than 25 feet square, bounded by careless, scoffing neighbors, where scrawny chickens scratched by day and tomcats yowled by night, with an eternal prospect of unkempt and barren backyards whichever way you looked, I determined to create a paradise.

"After dragging along, content with the mere suggestion of a garden, for four years, during which time I dug and raked in the most intractable heavy clay which even now is so hard in the dry time that it scarcely notices the onslaught of pick and shovel, I determined to make the season of 1909 bring forth my paradise. In the spring as soon as the frost was out of the ground I dug to the depth of one and

a half feet, left it to dry out for two days and then battered down the hard lumps and secured a fair seed-bed. I dug in the cinders from two tons of hard coal, and a large load of well-rotted leaf mold. Our planting time is three to four weeks later than it is in the Eastern states. I planted my sweet peas about the first of May, and the other seeds in season.

"Around the entire plot I planted a row of large Russian sunflowers. Next to these and one foot away I had previously dropped a row of sweet peas. In the centre of the plot were two clumps of runner beans and around each clump were several clumps of sweet peas. Then, without regard to the arrangement, I transplanted here and there tomatoes, pansies, stocks, petunias, verbenas, etc., allowing them morning sun and afternoon shade, according to requirement. Nothing failed. I trained everything upward, using tall stakes and twine for support. During the first week in September I had 19 Earliana tomato plants 6 feet high; 6 Plum tomato plants 7 feet high (all with luscious bunches of ripe fruit); sweet peas, 12 feet high; runner beans nearly 20 feet long, running criss-cross overhead with great clusters of pods; cucumber vines climbing upward and fully fruited, 8 feet high; and the greatest profusion of flowers, which seemed to thrive in the shade of the taller vegetation, all surrounded by the sunflowers, some of which measured 16 feet to the flower. From the 19 Earliana tomato plants up to September 23, when the first hard frost came, I plucked 250 pounds of fruit of a superb quality.

Training the tomato plants to a single stem on a single pole saves valuable space, increases the size, and improves the quality of the fruit considerably

I kept no account of anything save the tomatoes. Of these there was not a single spoiled or misshapen fruit. If I had been disposed to sell them all I should have had no difficulty in securing 20 cents a pound for them.

DOES HOEING PAY? WELL, RATHER!

"These results were achieved partly by the exceptional length of the season. But I think that the main reason for such splendid growth was the fact that the entire plot was hoed every day during the early part of the season and often in the latter part. I gave frequent irrigation with water that had passed through a leach of horse manure into which was thrown every three weeks a handful of sodium nitrate, about two pounds in all, at a cost of 12 cents, the water being applied plentifully to the soil between the rows, and not immediately around the roots. In this way the roots were encouraged to reach out."

Note the financial possibilities involved. Two hundred and fifty pounds of tomatoes worth, at her own estimate, $50.00 (not to put any price on the culls and unripe fruit), from two dozen vines! And then there were the flowers, which, to many a gardener, would have paid for the comparatively small amount of labor needed to hoe the whole 25-foot bed every day.

WHAT A GARDEN DID FOR AN INVALID

Another garden that developed from an unsightly backyard, required an attack of ptomaine poison-

ing, brought on by store vegetables, to start it — an impetus that I trust is not needed by many. But the effort succeeded and so did the garden. It consisted of about a quarter of an acre and the desolate appearance of "a waste of yellow sand with a ditch to be filled in and a conglomeration of tin cans and débris to be disposed of" almost discouraged the prospective tillers of the soil. However, in the spring, they used the winter's furnace ashes to fill in the ravine, dug and leveled the garden, and wheeled in several barrow loads of manure. They prepared a fine seed-bed nine feet wide the length of the garden, and in it grew seedlings for later transplanting; they planted corn lengthwise through the garden, between rows of other crops, and kept about them a loose dust mulch. Later they used the same space still further by sowing squash among the hills of corn. The result was an abundance of vegetables, sweet peas and other cut flowers, as well as both vegetable and flower plants to sell. Their assets were as follows:

Peas	$ 2.00
Beans	1.00
Corn	12.00
Tomatoes	2.00
Cucumbers	5.00
Other vegetables	4.00
Value of flowers	10.00
Cabbage plants	4.00
Various plants sold	3.50
2,000 pansy plants in stock for spring sale	40.00
Forget-me-not plants in stock for spring sale	5.00
Sweet William plants in stock for spring sale	10.00
Winter onions for early spring	15.00
Total	$113.50

— with only three dollars and a half for seeds, etc., as the cash outlay!

Such results as these are worth working for. *You*, too, can obtain them if you really set your mind on it. So I am going to give you all the assistance I can in the way of hints and instruction whereby you can get *the best and the most from small spaces*. If some of the schemes don't seem exactly to fit your garden, you can use them as hints, and evolve something along the same line to fit your own needs.

A NEW KIND OF ECONOMY IN THE GARDEN

On a small lot — especially a city place, try not to waste anything. Unless your street is sprinkled with oil, gather up the sweepings and the leaves from your neighborhood, and compost them (that is to say "compose a mixture") with other manure, if you can get it, the waste from the garden, and even table waste, which will not prove at all offensive if kept covered. Furnace and stove ashes, when sifted clear of clinkers, can be used to lighten the garden soil—especially if it is of the heavy clay type.

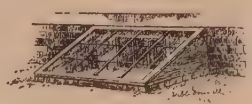
PLANT EARLY AND SMILE AT YOUR NEIGHBORS

In any garden, plant a little earlier and a little later than is recommended — general directions have to be merely averages which successive seasons often are not. So take advantage of the favorable conditions, and in a good many instances

you will win out with a lot to spare. One independent gardener reports having planted four 20-foot rows of corn, on July 22, in the face of discouraging opposition of all her friends. As "fortune favors the brave" (and the industrious) the weather was warm and damp, and effectively supplemented the regular use of the wheel hoe. On September 22, nine ears were picked. By October 19, ninteen dozen had been gathered, representing at that late season, at least $4.00. The seed had cost 10 cents, the labor was limited to a few minutes each day, and yet the cautious neighbors had not been able to see the sense of running the risk of losing the seed!

THE VERSATILE HOTBED

Of course, the great means for securing early vegetables is the hotbed and I hope that if you haven't one already, you will refuse to let another spring find you in the same fix. The hotbed is a



This "handy hotbed" is heated and cared for through the cellar window

permanent asset. Its cost of maintenance is limited to the manure used in it once a year, and replacing whatever glass is broken by carelessness; and it can be kept busy *all the year round.* In the spring

it is a seed-bed for early plants; during the later months for particularly tender sorts, or the fall ripening varieties; all through the summer for raising succession crops, or such moisture-loving plants as lettuce, which can be kept watered and shaded if necessary; in the fall, for lengthening the season for the less bulky plants, and for the growing of cabbage, roots, etc., for winter use; in winter, your exhausted hotbed becomes a cold frame, where parsley, violets, kale, etc., etc., can be grown for a continuous supply till the time comes to once more start the hot manure.

GROWING PLANTS IN A CHICKEN BROODER

A simple method for building the hotbed is given in the next chapter (page 107), but a certain resourceful amateur made use of an old, discarded chicken brooder, and obtained excellent results with a very little outlay. For the heater, he used a common kerosene lamp, which he operated through a cellar window. The brooder was set against the house, outside this window, on top of a square frame which raised the heating drum above the lamp chimney, and which was banked up with earth, to prevent the loss of heat. Around the heating drum, which resembled an inverted pan with holes in the sides, and half an inch from it, was fixed a strip of tin 4 inches high. The earth filled the space outside this tin "fence," and the one-half inch space allowed for the escape of the heated air. Even the surface space of the drum was not

wasted, for cigar-box flats, in which tender seeds were sowed, were placed directly on the pan. By throwing old carpets and matting over the sash (which also was a rescued outcast from an old window) a temperature of at least 60° was maintained at all times — even when down to zero outside, as it was several times after the first seeds were started on February 15. The total cost of construction and maintenance (oil) for that spring was $4.25, whereas the originator of the scheme netted over $12 worth of plants. No reason at all why you could not do just as well — or better.

HOTBED RESULTS — WITHOUT A HOTBED

Another simple means of hurrying crops is to grow them in flat boxes, in the kitchen, or in any sunny window of the house, where the temperature will not go below 60°. I have the record of a corn lover, who obtained ripe ears on June 20 by planting seed in boxes indoors on April 20, and transplanting to ground that had been well enriched with manure and wood ashes, when the days became warm.

There are countless little wrinkles for hurrying along individual plants. For instance, beans planted with the eyes *down* will make a quicker growth — other conditions being equal—than others.

HOW TO GROW VEGETABLES BEFORE YOU PLANT THEM

Potatoes, corn, carrots and probably other seeds can be sprouted before they are planted at all,

being given thereby a tremendous start. The remarkable record of potatoes in seven weeks from sowing was made in this manner. A bushel of tubers which had developed half-inch sprouts was

These potatoes are in just the right condition for careful planting. Be sure not to knock off the sprouts

brought up from the cellar and spread on trays in a light room where the temperature could be maintained between 40 and 65 degrees. The sprouts did not increase in length, but, with the surface of the tubers, took on a greenish-bronze appearance. On April 18, the seed was carefully planted in a light sandy loam, a pint of mixed hen manure and ashes being applied to each hill. The yield was 15 bushels in seven weeks!

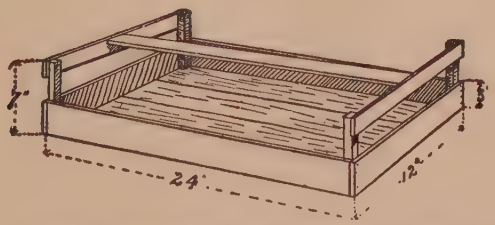
When sprouting potatoes, do not let the shoots grow more than an inch long, and take care not to break them in planting. But surely, in a small garden, whatever may be lacking in skill or experience, of care there should be and *can be* an abundant supply always on hand.

You can treat corn the same way, if you handle the sprouted grains like seedlings, and set them carefully in an upright position. The sprouting

of carrot seed before sowing, on rather a larger scale, is regularly done by a successful Long Island farmer.

MODERN SUCCESS — WITH OLD-FASHIONED METHODS

Probably you are familiar already with the soaking of the sweet pea, nasturtium, and other flower seeds, by which means our grandmothers used to get those beautiful, all-season effects. Why don't you adapt the trick to your vegetable seeds? Peas, beans of all kinds, squash, melon and cucumber seeds — all these are adapted to this kind of persuasion. I have noticed nearly a week's difference between the germination of soaked and unsoaked seeds — and anyone who has practiced this will doubtless tell you the same story.



Sprout potatoes in trays like this and they can be carried to the garden without being knocked about or having the sprouts broken off

By the way, while I am on this subject of seeds, let me emphasize again the importance of good — of the *best* seed. Look for it; buy it; pay willingly for it, then give it the treatment it deserves.

Particularly is this the case with seed you are able to save from one season's garden for the next. If you have an especially delicious variety of corn, and want to be sure of the same thing next year, pick out a hill, and let the ears mature, that is, become hard and flinty. But *don't* choose a measly, weak little hill from which you "don't want the ears anyway," and on which they are short, irregular only partly filled out. Choose the best hill you can find, and from it the finest pair of ears — large and full, covered with fat kernels all the way to the tip, and right up to the butt.

THE "BEST" POTATO, AND HOW TO OBTAIN IT

Similarly with potatoes. Save your ideal of potatoes for seed — or as near as you can get to it. It may cut you down a meal or so this year, but you will get that one back, and a good many extra ones besides, next season. If you are raising your own potatoes, go further than just a good tuber — choose the best, *most productive* hills for the seed supply. That is, the hills which give you the *largest number of the best potatoes.* I don't mean, as so many misinterpret it, the hill that gives you two whopping big fellows — over a pound apiece — and nothing else; nor the one with fifteen or twenty little spudlets an inch in diameter — very pretty to look at, but which have to be boiled (and eaten usually) with the jackets on. The "best hill" yields several — perhaps six, possibly ten — smooth, medium-sized tubers, the kind that boil evenly

all through; that the cook can peel in a jiffy; that buttered and salted are so almighty good that you refuse to remember what some one told you about "potatoes being so fattening." That kind reproduces itself just as well, and just as easily as the inferior ones and if you don't *prefer* it, well — you haven't got the stuff in you to make a gardener or anything else.

IT'S NEVER TOO LATE TO GARDEN

One more example of the late season gardening occurs to me. Most people would give up all hopes of fresh vegetables, if the ground hadn't been broken by July. But the people I have in mind didn't look at it that way, and the following is the tale of what they did. Keep this case in mind if you ever have to move in the springtime. A little gardening when you are located in your new home, will prove a change from "getting settled" indoors, anyway; also from paying grocer's bills.

A GARDEN PLANTED AFTER THE FOURTH OF JULY

"I have had great success in the vegetable patch when not a thing was planted before the Fourth of July. These kinds of vegetables have more than paid for the risk of late planting: cucumbers, squash, carrots, corn, lettuce, bush Limas, pole string beans, parsley, radishes and wax beans. Others that give fairly good results are, pole Limas, tomatoes, potatoes, beets and kohlrabi.

Kinds to plant for crops. "The ever useful Henderson bush Lima bean yielded a very good crop. The sowing of July 6 gave full-sized beans the third week in September, and picking continued until the end of October, at which time the plants were destroyed by frost. These beans are not as choice as the pole Limas, but I reserve a space for them in the garden each year, because they are so much earlier and hardier and less trouble to care for, besides being very prolific.

"After the pole Limas are in bearing, the bush Limas are used for either succotash, or, dried, for winter use.

"Cucumbers take kindly to midsummer planting, and make a good growth during the cool weather of early fall. The sowing of Japanese climbing cucumber made July 5 began bearing the last week in August, and gave us a continuous supply until the second week in October, when the frosty nights killed them. They would have borne still longer if frost had held off, as they were in good growing condition at that date.

"A planting made July 5, of crookneck squash, bore during late summer and early fall, and more than justified so tardy a start.

"A safe crop to sow at any time during July is carrots. The roots do not need time to mature before cold weather as they are excellent for the table when young and tender — the younger the better, indeed — before they reach full growth. Ours were sowed July 6, and we began to pull them the latter part of September. The second week in

November found them apparently unharmed by several sharp frosts that had killed the tender vegetables.

"One of the best vegetables for July planting is wax beans. The sowing of July 6 was in bearing by the third week in August, and the beans were better and larger than those from earlier sowings from the same lot of seed. Pickings were made at intervals, until the first week in October. Two weeks later they began with a second crop of blossoms and beans, but were cut off by frost.

"Radishes, of course, can be planted in July and later, even in September. Our July 6 planting was ready to eat in less than a month.

"We had not more sweet or tender corn from any of our eight sowings than that from an extra early sort sowed July 5. A twenty-five foot row gave us forty-five ears, the bearing season lasting from the last week in September to the first week in October.

"Pole string beans, Lazy Wife, planted July 7 had time to become even too large before the end of the season.

"Good-sized plants of parsley were had in October from seed sown July 6. The plants were in excellent shape to pot for growing in the house during the winter.

"A most convenient plant for late sowing is lettuce, as it will bear twenty degrees of frost, and not be killed. Last year I was still using full-sized heads from the open ground, for more than two

weeks after all the tender vegetables had been killed by frost.

"At a venture I tried a July planting of potatoes, an extra early variety being planted the third week in July. The vine made a growth of three feet, and late in October the crop was dug, two potatoes that measured two and one-half inches in length. This was not a very profitable yield, but it was interesting as an experiment.

"Near a stout, tall castor bean that served as a bean pole, some pole Lima beans were plantd on July 5. The vines attained a length of eight feet, and bore full-sized beans before frost caught them, but as a regular crop I should not advise planting them later than the middle of June, as they are very sensitive to frost, and do not have a chance to give a bearing season of any length, if sowed too late.

"For a family that enjoys pickles, even tomatoes are worth while sowing after Fourth of July. My seed was planted July 5, and, of course, the earliest variety obtainable was used. In spite of the handicap of transplanting, I had green tomatoes in October that measured over eight inches in circumference, surely large enough for pickles.

"For winter use, beets are sowed in June, so the July 7 planting did not yield full-sized roots, still young and tender beets are the best of all and even very small ones make a good dish cooked with the leaves as greens.

"Kohlrabi is supposed to be one of the best vegetables for late sowing, but mine were not started

soon enough. July 20 did not give the bulbs time to form before the growing season was over. Next time I shall sow them the first of July.

A Cultural Necessity. "An important element of success in July sowings is *pressing the soil into close contact with the planted seeds.* This is essential, for it causes the young plants to come up promptly, regularly, vigorously and straight, instead of feebly, unevenly and slowly, or else not at all, as often happens in midsummer when the soil is left loose and dry above the plantings. The later growth and even the maturity of the crop also share in the good effects. The seedlings get a good start before the weed-seeds, in the unrolled soil between the rows, have sprouted, so that the germinating vegetables can be cultivated before the weeds gain a foothold. In moist or heavy soils, or in early spring or late fall, when rains are probable, and the atmosphere is cool, this pressing of the soil is not so necessary, but in the loose, dry, crumbly soil, in which most of our summer planting must be done, it is important to firm every inch of soil above the seeds. It is not necessary to firm more than a narrow strip, except in the case of broadcast sowing. After firming, lightly *scratch the surface with a rake* to form a 'mulch' which helps to retain moisture and to prevent the formation of a crust through which it would be difficult for the seedlings to push their way. This principle applies to all kinds of seeds, and to transplanted plants, which can thus be protected from the wilting and burning that so often follow careless transplanting, in hot, dry

weather, when the soil is not properly firmed. The soil may be pressed in various ways: with the foot, throwing the whole weight at every step; by pounding with the flat side of a spade or hoe; with a board which may be walked upon till the soil is firm; or with a roller.

"Experiments were made to prove the wisdom of firming the soil. Patches of celery and cabbage were sown, and part of each planting rolled. Where this was done the crops were good, but *in the loose soil not one celery seed in a thousand germinated, and not one in a thousand of the cabbage seed.* Corn and beets, sowed the first week in July, and rolled, came up in four days and perfected their crops before the season ended, while the unrolled ones took twelve days to germinate and did not mature before frost checked their growth. In August spinach and turnips were sown and a portion rolled. The rolled portion came up at once and yielded a good crop while that which was not rolled burned up because the loose soil allowed the dry air to penetrate to the roots.

"As will be seen by the table, a harvest of nearly three months will come from vegetables sowed at Fourth of July, beginning with squash and wax beans about the middle of August and ending with carrots that do not mind the first frosts and can be left in the ground until November, when the season is suitable. Where I have added the word "frost" the vegetables had not run their course and would have continued bearing if the frost had been delayed.

TABLE OF FOURTH OF JULY GARDEN

VEGETABLE	DATE PLANTED	FIRST PICKING	LAST PICKING
Bush Limas	July 6	Sept. 23	Oct. 30–Frost
Cucumbers	July 5	Aug. 29	Oct. 9–Frost
Crookneck Squash	July 5	Aug. 19	Oct. 11–Frost
Carrots	July 6	Sept. 26	Nov. 11
Wax Beans	July 6	Aug. 21	Oct. 21–Frost
Corn	July 5	Sept. 26	Oct. 7
Potato	July 21	Oct. 30	
Pole Limas	July 5	Oct. 21	Frost

"Beside these were six other vegetables for which I do not have the exact dates."

DISCOVERED! THE REAL USE FOR A BACK FENCE!

A good many of your fellow-gardeners have already discovered the quickening effect of a windbreak on the north side of the garden, and so can you, especially if you live here in the North. If you are farming a city lot, the chances are that you are well protected by board fences, but if not, don't waste any time before putting up some kind of a barrier. Where there is room to spare, a hedge of evergreens (arborvitæ, hemlock or spruce), privet, or barberry will be effective as well as useful, but ordinarily we are not ready, in the backyard farm, to grow shrubs merely for looks. A board fence — or better, a brick wall — is a fine support for trained, dwarf fruit trees, the apples, pears and plums being especially adapted to this north wall

location. This treatment of tree fruits is, of course, an abnormal and artificial one. It has not yet become as important in this country as in Europe, and on a commercial scale is not likely ever to become popular. But in the small home garden it should attain a unique and an important position. When trained upon walls, fruit trees are pruned to a few main branches, which are fastened to the support in some symmetrical design. The simpler the design, the easier it is to care for the tree, since in each pair of balanced branches, each limb is attempting to obtain the greater amount of sap and outgrow the other. If you want the support for grapes, you will have to add some further trellis or frame to which the vines can be tied. Tomatoes, too, are often successfully grown on trellises. In this case the aim is to permit plenty of sunlight and a free circulation of air about the plants and fruits, hence the trellis should be set away from any wall or building. Among

The clothes pole need not be ugly. Pole beans will profitably drape one arranged like this; nasturtiums, dolichos or morning-glories will make it even more beautiful

the many excellent yields resulting from this sort of treatment, the following case is one of the most striking:

ONE FIFTH OF A TON OF TOMATOES FROM 300 SQUARE FEET OF GROUND

The seed was planted indoors in boxes on March 15; when two inches high the seedlings were transplanted to 2-inch pots, the more vigorous being later shifted to 4-inch or 5-inch pots. On May 20 the first plants were set out, and for several nights were kept covered. For supports there were used four rows of wire netting, 20 feet long, 3-½ feet apart, fastened to 7-foot cedar posts set 2-½ feet. The netting, 3 feet wide, was fastened level with the tops of the posts and supported between them by three smaller intermediate posts. Twenty-five plants were set along each row of netting; twelve on one side, thirteen on the other, eighteen inches apart, about four inches back from the wire, the plants alternating with those across the row. Chalk's Early Jewel and Ponderosa were used.

GETTING ALONG WITHOUT MANURE

No manure was available, but cultivation was thorough, and Canadian wood ashes were liberally applied. The plants were set deep, with the two lower branches removed, a pint of wood ashes being mixed with the soil, and the whole pressed down firmly.

Tobacco dust was applied until they began to grow rapidly. When the vines were 18 inches high the main stem was tied loosely to the netting and thereafter once a week the vines were pruned and tied up. No attempt was made to confine the vines to a single stem; they were allowed to branch moderately and fill the 18-inch space allotted to each. In height they grew about a foot above the top of the netting, and then were stopped by pruning.

The rows ran north and south, and about half the foliage was removed to admit sunlight. The leaves were allowed to remain in the rows as a mulch. After the plants began to grow vigorously cultivation was discontinued for fear of injuring the root system. After the last cultivation the space between the rows was covered with grass cuttings and boards, which prevented the compression of the soil, by walking. In times of drought a gallon of water per week was given each plant, care being taken to wet as little as possible of the ground surface.

The crop was so large that, besides supplying a surplus over daily consumption, it resulted in ninety-five quart jars of canned fruit, and a generous provision of sweet pickle. There were counted eight hundred fruits, averaging half a pound apiece. The largest weighed 18 ounces. The most convenient size for canning is 12 ounces, for the table 6 ounces. It may be of interest to state that in canning, 42 ounces of unpeeled tomatoes are required to fill a quart jar.

MAKING TOMATO PLANTS PERENNIAL

The raisers of that crop would probably have been glad to know that they could keep their tomato vines all winter, by cutting them back in the fall, and storing them in dirt or sand. They should be kept moist, and away from any chance of frost action. The result will be a saving of three weeks or so in the ripening of the fruit the next year.

MAKING YOUR OWN SPRINGTIME

There are a few perennial crops, too, which can be hurried into bearing in the spring. If you cover a few asparagus plants, or a lusty rhubarb, with a barrel and bank fresh stable manure up around it, you can be gathering those vegetables before their unprotected brethren are even awake and growing.

HOW TO DOUBLE THE CABBAGE CROP IN YIELD AND QUALITY

The season of several crops can be lengthened at the other end by the knowledge of a few interesting points, which might not occur to one spontaneously. For instance, don't pull up your cabbages. Cut them off, leaving all the stalk you can, and in a short time a cluster of small heads will develop, which will provide you with some of the tenderest and most delicate cabbage you ever ate. You can afford to harvest these soon, while they are tenderest, for they represent a supplementary crop, a sort of free premium that you weren't, perhaps, expecting.

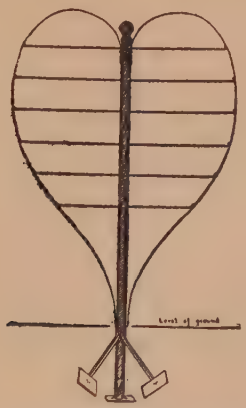
THE TWO GREATEST GARDEN PROBLEMS — THEIR SOLUTIONS

Probably the two most important problems to solve in the backyard garden are, first, the utilization of space to the best advantage, and second, the reduction of expenses. I doubt if there is any one best solution of the first problem, any more than there is any one "best" garden plan. Every distinct set of conditions calls for a different treatment, and every touch of personal experience and ingenuity increases the efficiency of any previous plan for saving space. Similarly, you will doubtless think of many ways in which to obviate certain expenses. For instance, if you find it difficult to procure good bean poles, spend a few cents for sunflower seed, start them early in the season, and transplant when a foot or more high, to the bean hills — or rather where the bean hills are to be — sowing the beans around the sunflower. This, in one case at least, solved the problem admirably, with apparently no effect on the quality or yield of the beans. All that was necessary was to strip off the lower leaves of the sunflower stalk, that light and air might reach the bean vines.

DOUBLE THE USEFULNESS OF THE CLOTHES POLE AND BEAUTIFY IT

Another scheme combining economy, and attractiveness, is the training of bean, cucumber or tomato vines over the clothes poles. The former plants almost invariably become sufficiently luxuriant to

drape, if not to screen such objects; where tomatoes make a growth of seven or eight feet they, too, will prove useful. A little care will prevent injury



An inspiration resulted in this clothes pole on which crimson ramblers were grown. The trellis is of strap iron, available at any blacksmith shop; the pole is of iron pipe

to the vines when the poles are in use, and if you set them deeper than usual, there will be no danger of the poles loosening in the small area of tilled ground around them.

A WELCOME FOR POULTRY IN THE GARDEN

A few poultry enthusiasts who are also garden lovers, have discovered substitutes for insecticides, in the form of ducks and chickens, which are both

practical and a means for reducing expenses. One tells us that if the asparagus beetle becomes troublesome, a few hens turned into the patch speedily clean up the pests, with distinct enjoyment and benefit to themselves as well. Ducks, on the other hand, are connoisseurs on the subject of potato bugs, and in not a few cases are regularly let in among the potato and eggplant hills, to render unnecessary arsenate of lead and "hand picking." I might remind you, too, that poultry is of no little value to the gardener as a manure producing element. The refuse from the poultry house is an especially quick, rich fertilizer, in fact, it must be used with a little caution lest it burn the plants through too intimate contact.

THE SECRET OF SUCCESSFUL GARDENS

The key to the situation in the matter of saving space might be expressed as follows: Throughout every foot of the garden, plan a second crop before the first is harvested, and do not let the ground remain idle between the two. This may be accomplished in two general ways; first by succession, second by companion cropping. An excellent example of the latter is the practice of sowing radishes and beets, carrots or parsnips in the same row. The radishes germinate first, break any possible surface crust, and ripening rapidly, may be harvested before the permanent crop needs the space. Radishes can be used in this way with a number of other crops. One individual says:

"Sow radish seeds in cucumber and squash beds, and you will not be troubled with the vines being eaten by the striped bugs. As the radishes grow, they may be pulled for the table, for by that time

Plant radishes around melon, cucumber and squash hills. Cutworms will attack them rather than the more valuable melons — and if there are no striped beetles about, you will be the gainer by that many radishes

the danger to the cucumbers and squashes from the bugs will be past. The radish seems to possess a pungency which is effectual in driving away the bugs."

COMMERCIAL METHODS WORTH COPYING

Many commercial market gardeners have reduced this combination planting to a science. In raising early cabbage a common scheme is to set the plants every 15 inches, in rows 30 inches apart. Between each cabbage in every row is set a lettuce plant, and a continuous row of lettuce is sown midway between the cabbage rows. Then in the centre of the 15-inch spaces thus made and between every cabbage and lettuce plant, radishes are grown.

Spinach is another crop which matures rapidly and is well suited to filling out either end of a season. It can be removed in time for the setting out of egg-and-pepper plants, or will easily reach the cutting stage on the same ground from which early potatoes, beans, etc., have been harvested.

Onion sets prove useful in keeping the soil busy. If, whenever an onion is pulled, a set is thrust into the resulting space, there will be practically an unbroken succession of this popular vegetable. Onions from seed can be raised between the asparagus plants, being sowed when the cutting season is over. The cultivation, which I presume you will undoubtedly give the bed, will benefit the onions as well.

Another gardener of small spaces used the following rotation: He planted an early variety of corn between alternate rows of potatoes after the last cultivation. On August 6, when the potatoes were dug, he sowed winter turnips in their space, which, of course, did not interfere with the well-developed corn.

OVERTIME GROWTH IN THE STRAWBERRY BED

Another plan is to utilize the strawberry bed for something besides strawberries every year; if you can feed all the plants well, this plan is a good one. Let the berries bear for two years, that is, occupy the ground for three. During the first season grow cabbage and cauliflower between the rows. This will insure cultivation. The second season, after berry picking is over, plant some late

crop, such as spinach, beets, lettuce or beans. The third year, when the plants have produced their second crop, plow up the bed, manure it and set late celery. You may choose to keep the rows clear the second year in order to pot runners and secure new plants. But this would require but a part of the bed at most.

BARRELS OF STRAWBERRIES! DOING AWAY WITH PLOWING, CULTIVATING AND MULCHING

Speaking of strawberries, perhaps the most intensive method of raising them is in barrels. In the desire to be strictly agricultural and to grow crops in convenient, straight rows, gardeners have lost sight of the advantages of increasing their garden space vertically, a method which was tried with notable success a few years ago. The originator gives the following prospectus: Barrels can be placed four feet apart (centre to centre) allowing 2,500 barrels per acre. At the rate of ½ bushel per barrel (which was his yield) this would amount to 1,250 bushels per acre, or (at a conservative estimate of 10 cents per quart), gross returns of $4,000 per acre!

Now I know skeptics — and perhaps you, yourself — will say, "Oh, that is too much, that sort of dream never works out," and forthwith begin to discredit my advice — which is just the point. *I do not advise* figuring on any such returns *per acre.* That is just what I was driving at in the previous chapter; that *profits which are perfectly normal*

on small areas do not always increase proportionately for larger areas. Therefore, while $4,000 an acre from strawberries sounds too good to be true (though, mind you, I don't say it is impossible), yet half a bushel per barrel, and five bushels from ten barrels out in the backyard, is entirely possible,

Two crops that can be grown in barrels. On the right, strawberry, (see text). On the left, celery. Use a perforated stovepipe in the centre; and add soil gradually as the plants grow and require blanching. But, as always, keep dirt out of the heart. And don't forget to have holes and coarse drainage material in the bottom of both barrels.

and indeed a splendid means of bountifully supplying your family with this universally popular fruit. The details of this method are as follows:

Take any iron-bound barrel, except one which has been used for pickles, sauerkraut, or vinegar, remove all hoops but four, and bore four holes in

the bottom. Then space holes around the barrel so that twelve plants will go around it; five rows high will make sixty plants to the barrel. (The fifth row can be placed five inches from top of barrel.) To make the holes of proper depth, bore two holes, one above the other, using a one and one-half inch bit, and cut out the wood between the two holes; you will then have a hole one and one-half by three inches. Put about two inches of firm gravel or coarse sand in the bottom of the barrel. When planting, put the plants as near the top of the holes as possible, to allow for settling of the soil. Use clay, well mixed with rotted manure; put in till about three inches above the first row of holes, being careful not to have it too wet.

The first row of holes must be eight inches from the bottom of the barrel. Get in and tramp the soil solid, then loosen with a trowel where the plants go and plant that row. Spread out the roots well, then put soil about one-half way up to the next row of holes. Now put a common drain tile, twelve inches long by three or four inches in diameter, in the centre of the barrel, and fill it with coarse sand; then fill up the barrel with soil to a little above the next row of holes and tramp again. Be careful not to move the tile and when adding soil to the barrel, cover up the tile, so as not to get any dirt in it. After planting the second row, lift the tile; see that the sand settles, then fill the tile with sand again. Put in soil above the next row of holes, tramp again, and plant that row; and repeat operation until five rows are planted. But don't fail to tramp.

After planting, the tile remains in the barrel; leave it empty so as to take water, which is poured into the tile for the lower rows; on top of the barrel for the two upper rows. It would be impossible to water the lower plants without the tile and the core of sand. You can water the plants too much. Fill the tile once a day, and put about two quarts of water around it. After cold weather sets in quit watering. The plants want no winter protection. Set the barrel on bricks to keep it off the ground. If any should die in the summer, you can replant by taking a runner and putting the young plant in the hole, making it fast with two little sticks.

III

SUCCESSFUL GARDENS YOU CAN HAVE

YOU want to know what you can expect, if you begin this intensive backyard farming at home. Some of the recent achievements of suburban gardeners are not only useful from a practical standpoint in supplying various ideas, but also inspiring in the fact that they are actual results, such as you can and ought to effect.

I shouldn't be surprised if I repeat these exhortations in behalf of a garden a number of times before I get through. For I want you to become so imbued with the spirit of the thing, and so interested, excited, curious, incredulous — whatever you like — that you will really try a garden this year. Get some catalogues, make your plans — just get started *once*, and I'll not have to mention the matter again. You won't be able to let go of it; you will only regret that you didn't realize before what a great thing a garden — *a little garden* — really is.

1200 PER CENT. PROFIT FROM 20 X 27 FT. OF GROUND

"Our available space measured up to a total of 540 square feet, and a few trenches for sweet peas.

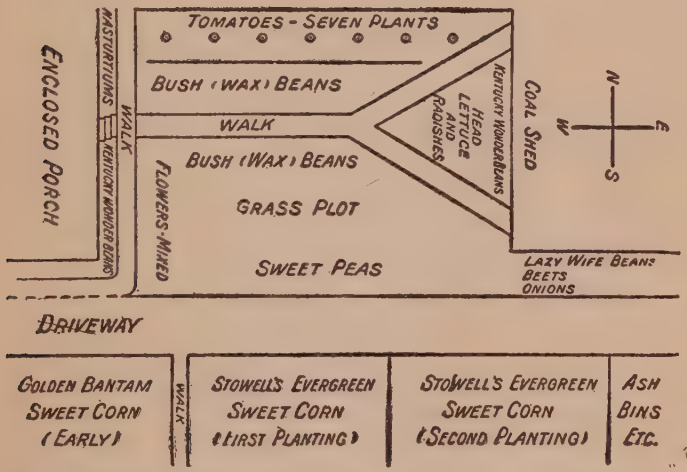
"We had wax beans from June 26 to July 31, nine and one-half pecks, valued at $2.27; pole beans from July 1 to September 26, eighteen and one-half pecks, worth $3.94; sweet corn from July 3 to September 2, 204 ears, worth $3.98. The tomatoes yielded from July 18 to October 4 eight and one-half bushels, worth $4.70. Of the early lettuce, radishes, onions and beets we kept no accurate account, but we would have had to pay at least $1.50 at the grocer's.

"The time devoted to working in my garden was that remaining out of office hours, 8 A. M. to 5 P. M. The three obstacles of little time, little space and little knowledge were overcome, and the table for a family of four was kept supplied with crisp, fresh vegetables.

"As soon as the ground was in condition to work, it was spaded up, and the soil — a tough, yellow clay — worked as thoroughly as possible with hoe and rake. A quantity equal to two wagon loads of old, black, stable manure, hauled by the wheelbarrow load, was carefully worked into the ground. We had decided to begin with only the staple summer vegetables — tomatoes, beans, corn, beets, with lettuce, radish and onion for early spring greens. The garden was laid off, as shown in the accompanying diagram.

"The strip on the south side of the division fence, four feet six inches wide by eighteen feet long, was devoted to tomatoes, seven plants. Bordering the walk, strips eighteen inches wide by ten feet long were devoted to early bush wax beans. A strip

eighteen inches wide by seven feet long, at the back of the enclosed porch, was given to the old-fashioned pole beans, as was a strip eighteen inches by nine feet at the front of the coal shed and another eighteen inches wide by ten feet long at the end of the shed.



This business man's garden which cost a dollar and produced fourteen. Business methods pay in gardening, too

"Outside the driveway was a plot nine feet in width, running the full depth of the yard. This was divided into three 15-foot spaces, in which sweet corn was planted. In the 'V' of the rear walk, a bed for head lettuce was made, French radishes being sowed between the rows of lettuce. At the end of the shed, between the space given up to beans and the driveway, was a plot ten feet long

Goshen College
Library

by four feet wide; this was utilized for spring onions and early beets.

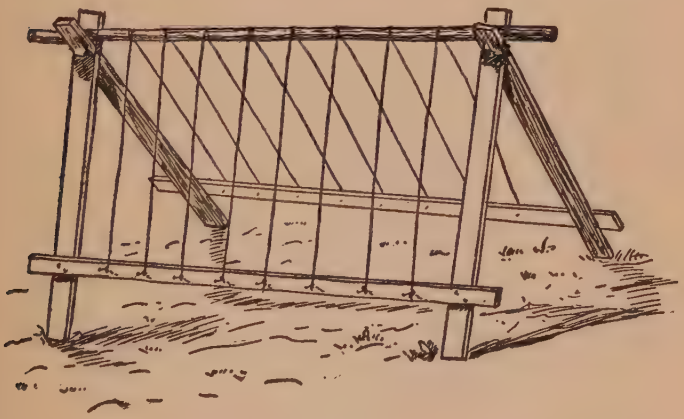
"The purely decorative gardening was confined to a strip a foot wide and ten feet long, beside the driveway, wherein was made a trench for sweet peas. A double trench for the same flowers gave two 20-foot rows toward the front of the yard and outside the driveway; climbing nasturtiums were planted beside the back steps and at the south end of the enclosed porch, and a small bed of old-fashioned flowering plants was made beside the walk leading around the house. One plot of corn was planted with Golden Bantam for first crop, while in the other plots, two plantings of Stowell's Evergreen were made a month apart.

BEAN STRINGS, CHEAPER AND SIMPLER THAN POLES

"For the climbing beans, small stakes were driven deeply into the ground at the ends of the trenches, and strong wire was run across from one stake to the other. Then stout twine, such as is used in tying heavy parcels, was strung from the wires to the walls — the walls being, in one case, the lattice of the enclosed porch, and in the other the front and end of the shed. The strings were placed three or four inches apart and were run up about seven feet.

"For the support of the tomato vines a trellis, English fashion, was planned, the intention being to hold the plants well up from the earth so that the air might circulate freely under and through them

and the fruits thus be kept off the ground. The estimate of the probable growth was entirely too low; the tomatoes finally attained a height of fully seven feet from the ground. The beans attained a similar height and the pods were always clean and easy to gather.



A simple trellis for beans, peas, or even tomatoes, that can be knocked together when bean poles and brush are not available

"The bush wax beans came to maturity at least three weeks before the climbing kinds, and from the twenty feet of row, we gathered five pecks. While the bush beans were still in bearing, the climbers matured their earliest pods, and in repeated pickings, the last of which was made about the middle of September, the vines produced two and one-half bushels of as fine 'snap' beans as anyone could desire. Two varieties were planted — one

called Kentucky Wonder, and the other, a week to ten days later, called Lazy Wife. The Kentucky Wonder is certainly true to its name, many of the pods picked being more than eight inches in length, and a number of the fully matured ones measuring eleven to thirteen inches.

"Seventy-eight fully developed ears were pulled from the early corn, over a period of three weeks, the two later plantings furnishing 126 roasting ears, through a season of about seven weeks.

"The tomatoes planted were of the variety Beefsteak, large and solid. The first ripe fruits were picked on July 18. At one time the seven vines were set with over two hundred fruits, and from their first bearing until the end of the season, with the frost in October, they furnished an ample supply for the table, as well as an abundance for making catsup, Chili sauce, etc.

EXPENSES, $1 PLUS; RETURNS, $14 PLUS

"As for the cost of the garden, less than one dollar covered the entire cash outlay for seeds, etc. A single packet of nitro-culture sufficed for treating all the seed beans, and this cost twenty-five cents. The manure cost nothing; spade, mattock, hoe and rake were already on hand; therefore, the total cash outlay involved in making this experiment in "intensive farming" was only $1.15. Close account was kept of all vegetables used, the market price of the produce at the time being set down, and by the end of the season the city backyard, that had been considered too small for anything larger than

a flower bed, had produced, according to the actual market prices, $14.52 worth of the finest of home-grown vegetables.

WHAT SCIENCE HAS DONE FOR THE GARDEN

"I made a comparison of treated and untreated beans, and am entirely satisfied that nitro-culture increased the yield. The soil was prepared in precisely the same manner in all cases, and the beans were all weeded, hoed and watered exactly the same. From the 7-foot row of Kentucky Wonder beside the porch (given the treatment), we gathered five times the quantity of beans plucked from the untreated 9-foot row. The vines, too, made a growth of from two to five feet greater length. I also treated our sweet peas, and in the entire neighborhood ours were the only ones which were a success, flowering until September and being nearly seven feet in height. The soil is a tough, hard, almost unworkable yellow clay, that must be cut up with sand and fertilized until there is little of the original soil left."

That is not a bad season's work for a man who could be at home only before eight and after five. And I've never a doubt that he was also far better, physically, with the work to do, than he would have been without it.

THE REDEMPTION OF A 28-FOOT-SQUARE BACKYARD

Actual examples are more effective than mere precepts. Therefore I want you to read carefully what was done to make a city backyard pay for

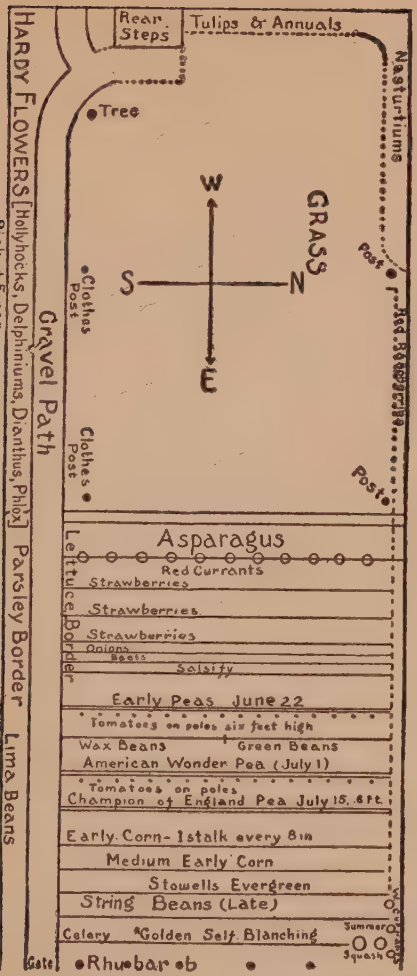
itself. Notice that there was no fertile, well-tilled soil in evidence when these gardeners started in; that they practically pulled success out of the chaos that the housebuilders left.

"My small city backyard garden (28 x 28 ft.) was a decided success last year. The produce grown on this very limited area was nearly all that was needed for a family of three, and part of the time six, from May to November; while squash and celery were to be had in December. Besides, there were twenty quarts of strawberries, and from the two-year-old currant bushes four quarts of fruit were picked. At prices charged for the various things by our groceryman, the entire produce would have cost me more than thirty dollars.

"Upon the north and east sides there is a high board fence, while upon the south there is a low picket fence, which give full exposure to the sun, and at the same time protection from north winds.

"Lettuce and radishes were sown in different parts of the garden early, where later, partly grown plants were to be set so that the first crop did not interfere in the least with the second. Successive sowings were made wherever a little space could be found. The result was that all the ground produced two crops and most of it three during the season.

"Cucumbers planted between the strawberries and the onions did not demand room until after both crops had been gathered. Four hills of these were trained up on brush, and two were allowed to run over the strawberry bed.



Plan of the 28 x 28 ft. garden that produced enough vegetables to supply a family of three from May until November, besides an abundance of flowers all summer

"In addition to the one row of onions, sets were put in wherever room could be found, and these were pulled as soon as large enough for use.

"The early pea vines were pulled up about July 1, and this space was set to Golden Self-blanching celery in a double row, which yielded about sixty good bunches for late fall and winter use.

"Meanwhile a row of late tomatoes had been growing on the east side of the early peas, and another of early ones by the side of the dwarf peas. These were trimmed to one stalk, and fastened to stakes six feet high. All foliage was removed for about two feet above the ground.

"A row of string beans took the place of the dwarf peas, and yielded a fair crop in spite of being less than a foot from the tomato plants.

"In the corn rows a few pole beans of the wax variety were planted, which made good use of the old stalks for poles. Also two or three hills of winter squash were planted which in the late summer completely covered the space where the corn had been.

"There had been applied plenty of fertilizer from a neighboring barnyard in the early spring, while during the growing season nitrate of soda had been used as frequently as the plants could assimilate it. The entire growth was luxuriant, though the crowded condition prevented the best development of everything, yet there was not a single failure.

"The results are for the second summer. The beginning was made on the sand and gravel left

WHAT THE SQUARE YIELDED

Name	Variety	Quantity	Value
Bean	Stringless Wax. . .	25 quarts	$1.25
	Stringless Green Pod Pole Wax	25 quarts	1.25
	Dwarf Lima . . .	7 pints	1.05
Beet	Early Blood-turnip .		
	Midsummer . . .	30 bunches	.75
Celery	Golden Self-blanching	125 stalks	5.00
Corn	Ideal		
	Champion	10 dozen	2.00
	Stowell's Evergreen .		
Cucumber	Extra Early . . .	60 large	1.50
	Fordhook . . .		1.57
	Improved White Spine	3 quarts	.30
Currants	. . . . .	4 quarts	.40
Lettuce	Grand Rapids Forcing		
	Giant Crystal Head .	200 heads	5.00
Onion	White sets . . .	30 bunches	1.50
Parsley	Champion Moss Curled (Large quantities unused)	10 bunches	.30
Pea	Extra Early Prolific		
	American Wonder .	40 quarts	2.00
	Champion of England		
Radish	Twenty-Day Forcing	20 bunches	.50
	Red and White Delicious		
Salsify	Long White . . .	15 bunches	.90
Squash	Early Crookneck . .	40	1.00
	Large Winter (name unknown) . . .	6	.90
	Sweet Potato Squash	50	1.25
Strawberries	. . . . .	20 quarts	2.50
Tomatoes	Early Freedom . . .	4 bushels	2.60
	Ponderosa		
	Total		$33.52

by the builders. The yard has been completely changed from the usual unattractive city 'clothes yard' to a place of beauty and genuine utility."

WHAT ONE WOMAN CAN DO WITH $10

I would be disappointed if you could not find faults in some of these records, which you would plan to better in your own garden. You may not agree with the theory mentioned in the next account, that forty-foot rows are too long for comfort, especially if you use a wheel hoe. But that is just the sort of thing that can be settled best by each individual. On the whole, though, I think a woman is well on the road to success when she can attain results such as those below. Moreover, she limited herself to a definite expenditure, and *did not exceed it.*

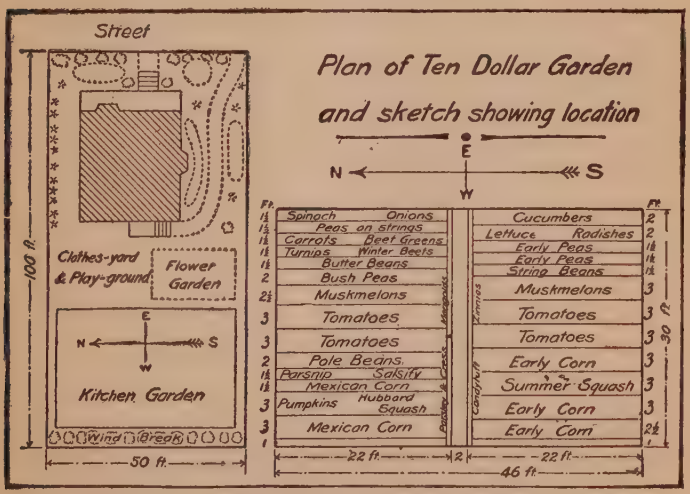
"Last year I decided to attempt a vegetable garden, and for fear of failure, determined to limit my outlay to ten dollars. Throughout the season an account was kept of the produce from it, at market prices, and I found that it yielded nearly double the amount of my outlay.

"The vacant land at the rear allowed a garden plot forty-six by thirty feet. Early in March a plan was made, using the notes taken in my neighbors' gardens and following the more specific directions on varieties and spacing found in reliable seed catalogues. As I could think of nothing more discouraging than to weed rows over forty feet long, I decided to cut them across the centre with a path two feet wide, distinguishing this walk by an edging of flowers. This made two sections, with rows

twenty-two feet long, running north and south. Beds there were none, as with flowers I had learned that rows were much more easily cared for.

"In the sunniest end of the garden early peas, lettuce, radishes, cucumbers, and string beans were planted. A few hills of muskmelons, one dozen tomato plants, three rows of early corn, and one row of summer squash were also to go in the southern half of the garden.

"On the other side of the path (toward the north) rows of Black Mexican corn, pumpkins and Hubbard squash, parsnips and salsify and pole beans were



How to plan so as to raise all the vegetables for the family on a 50 x 100 ft. city lot

planted. Being anxious to have plenty of tomatoes for preserving, twelve more plants were put here,

also five additional hills of melons, and one row of bush peas to be my second crop. Turnips and winter beets shared one row, carrots and beet greens another. Next came a variety of late peas which I had been advised to plant early and train on strings. Just here, at the eastern edge of the garden, where the soil was exceptionally deep and loamy, space was devoted to a row of spinach and onions. After a few seeds of parsley and cress were sprinkled along the path its borders were to be filled up with zinnias, marigolds and candytuft.

"The plan did not reach this finished state until I had spent many hours thinking it over and readjusting it. Once completed, however, the seeds were ordered immediately, that I might have no opportunity for changing my mind.

"In April, as soon as the frost was out of the ground, the land was plowed. As the earth was new, there was much work then to be done in the way of pulling up sods, throwing out stones, and spading, where specially well-worked soil was needed. At first I undertook to do all this myself, but was finally obliged to hire a man for the heavier part of the labor. By working with him the work was finished in less than a day. Lastly the garden was raked three times.

"No change in the plan was found necessary when planting the seeds, but, figuratively speaking, it was necessary to have the catalogue tied to my apron-strings, for constant reference as regards time of planting, distances, and depth. As the soil had not been worked for some years I was ad-

vised to use a little commercial fertilizer to start things, in addition to the stable manure which would carry them through the season.

"It had been predicted that the two kinds of corn would mix, as both were planted in such a small area, but by delaying planting one variety for three weeks I had no such trouble. After the earliest peas were gone, lettuce was planted in that row, while more peas (a wrinkled variety) went into the original lettuce row. When the carrots were ready to be thinned out the surplus plants were transplanted into the other half of their row, which had previously been filled with beet greens. The string and butter beans were successful, but the pole beans did not mature so well, although their flavor is good. I learned, however, that more fertilizer is required for that kind than for other varieties.

"Tiring of radishes in July, endive was planted, which was taken into the cellar in the late fall and lasted some time for use in salads. There were really more cucumbers than I could use, but some were disposed of by pickling. The turnips were a failure, as the damp soil was too heavily fertilized. The parsnips were left in the ground till winter.

"At first the different bugs and worms seemed a great problem, so far did their numbers exceed those of the insect pests common to flower beds; but I found that by fighting them systematically I could check their depredations. Later on, the toads proved to be such willing partners that I introduced a plentiful supply into my garden.

SUGGESTIONS WORTH MONEY

"In August, some one suggested cutting off the tops and branches of the tomatoes, leaving only three stalks to a plant. I tried this with a dozen, which were tied to stakes; the others were left to grow as they would, supporting some in frames made of barrel hoops and staves, and tying the others to lattices which were at hand. The first method is the best, as *it economizes space, and results in larger and more abundant fruit.* The cost of fertilizers is reduced by the use of wood ashes, of which I collect about a bushel in a winter. Another economy is a compost heap, where are thrown old vines, the kitchen waste, and autumn leaves raked off the front yard. These last retain moisture and will be decomposed by spring. When recommended to me, I thought such a collection would make an unsightly object, but this difficulty was rectified by sprinkling seeds of wild cucumber and scarlet runner over the heap, and planting around the edge a screen of Russian sunflowers.

LIST OF EXPENDITURES

Plowing	$ 1.00
Commercial fertilizer	1.00
Manure	3.00
Seeds	2.50
Tomato plants	.50
Bean poles	.50
Insecticides	.25
Labor hired	1.25
Total	$10.00

"The hardest work of all in my garden was thinning and transplanting, but it was at the same time really the most interesting. Weeding was done daily, never letting the weeds get ahead.

"My western wind-break of wild barberry (*Berberis vulgaris*), is the outcome of several years' labor and is effective, both as regards use and beauty. The scent of its yellow blossoms fills the spring air, and its cardinal fruit adds to the brightness of autumn, while some remain even through the winter snows.

"The thorns prove an additional safeguard against small boys, who never make a second attempt to crawl through."

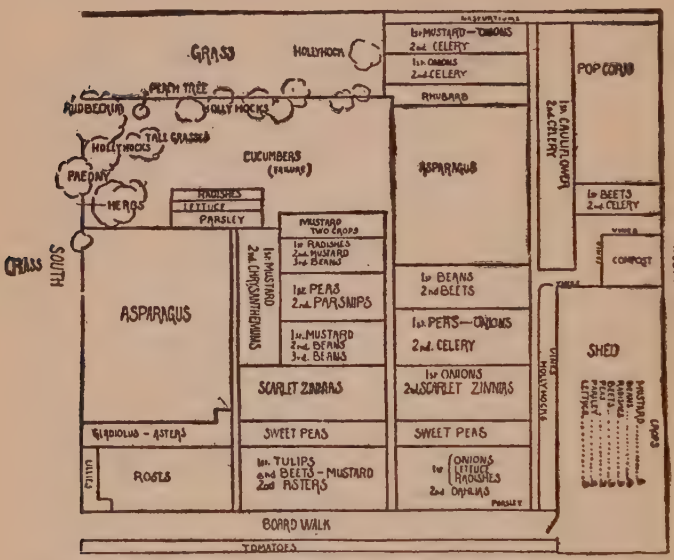
A PRACTICAL WORKING CALENDAR

I am going to have a few things to say about garden records further on, but in anticipation of them, the calendar of a backyard garden is full of interest. A space 40 x 45 ft. is not large enough to require voluminous diaries, but it will give you something to think over, and a good deal on which to base future plans and additions. You could not do better than to follow the example set by this garden maker, in beginning work in February — unless, indeed, you began in January.

"One sunny afternoon in February the first garden work was done. The whole afternoon was spent with catalogues and the record book of the year before. By night two short seed lists were done, and a list of plants started.

"In a garden as small as this it does not pay to

raise corn, peas (except the earliest), cucumbers, squashes, potatoes and a few other things that take up too much ground.



The 40 x 45 ft. garden. Every foot was kept busy and parts of it grew three crops. Can you do as well?

"I always plant flowers that bloom for the longest period, e. g.; zinnias (always Dwarf Fireball), because they make a gorgeous show of red from June till frost and stand our dry summer weather.

"March 6 the first planting was done. Ponderosa and Freedom tomato seeds were sown in a box filled with earth saved in the cellar. A week later, rhubarb, hollyhocks, and tulips showed signs of life outdoors.

"March 19. I planted sweet peas.

"March 25. The tomatoes were up.

"April 3. I started a box of zinnia seeds.

"April 5. The first outdoor planting of radishes, beets, lettuce, mustard and onion sets was made. Two dozen tomato plants were transplanted to another box, to allow them more room.

"April 9. We used the first rhubarb from the garden. The year before the first rhubarb was pulled on March 31.

"April 13. Nott's Excelsior garden peas were planted. Early Alaska is the best in this section for early planting. More onions were at this time set out.

"I firmly resolved that next fall the whole garden should be spaded over. Last fall, being busy, I did not get it all dug. *The part not dug was now a week behind!*

"The second week of April, asters were planted in boxes and hollyhocks were transplanted to a row along the south side of the woodshed to hide the building as much as possible. The hollyhocks sow themselves. A few in odd corners are allowed to grow the first blossomless summer. Next spring I transplant them to permanent quarters.

"The third week in April things began to grow encouragingly. Beans were planted — the Stringless Green Pod variety.

"The last week in April the weather was nearly warm. Nasturtiums were planted against the wire fence next the street. A dozen cauliflower plants were bought for ten cents and set out.

"Asparagus, eagerly watched for, now got above ground. New plants (Palmetto, three years old) were put out two years ago.

"April 23 tulips began to bloom. April 26 the first asparagus was used. More peas planted. Gladiolus bulbs put out. April 30 the tulips were at their best.

"The first week in May more beans were planted. Some of the zinnias in the seed box were set out. Asters were transplanted to two inches apart in another box.

"May 9. The third crop of mustard was put out. Used as greens instead of spinach we find mustard more palatable because of its pungent taste.

"May 12. The plants came. This is always nearly as big a day in making the garden as the day peas are planted.

"The next week the tomato plants were set out.

"May 23 was another big day. The first sweet peas bloomed, the first in town. A small square of golden yellow popcorn was planted for the boy's amusement. Before the 31st tomatoes and roses were in bloom.

"In June flowers began to bloom on every hand. All the plants started in the house were put out. Tulips were not dry enough to dig until the middle of the month. They were succeeded by asters in four varieties. June 8 a hundred celery plants, bought of a gardener for forty cents, were put out between rows of cauliflower, mustard and peas. They were four inches high. In less than a month mustard and cauliflower were out, leaving the

ground to the celery. In June we got all the cauliflower, beans, radishes, young onions, lettuce, mustard, rhubarb and asparagus we could use. We quit cutting asparagus June 15, to let the plants make roots for next year. Parsnips were now put out.

"July was easy. Not much to do but hoe. Beets swelled fast. Onions got big and round and lay basking in the sun. The dwarf scarlet zinnias absorbed so much sunshine in daytime that they themselves shone late into the dusk. Sweet peas bore prodigiously. Besides hoeing after every shower, there were, in July, stakes to set and plants to tie up. Dahlias, gladioli, tomatoes, chrysanthemums, even hollyhocks, had to be staked and tied. As fast as one crop got off the ground another was put in. Asters began to make a great showing. July 18 tomatoes were ripe — two weeks late. On the 23d the last of the onions, about a bushel and a half, was dug. Tomatoes now began to bear well.

"August, too, was easy. Asters still made a show. We had the best dahlias in town. We got $4 worth of Caroline Testout roses. The last of August beans and lettuce were planted for the last time.

"September was August over again. The garden still made a great show but the work had been done. Celery was watered. September 23 the first of it was banked up. In October the last of it was banked and boarded up to blanch.

"The first two weeks in October we had a good show of dahlias and pompom chrysanthemums. In vegetables we had green beans, beets, mustard,

tomatoes, parsnips, lettuce, parsley, and were beginning to use the celery. The last was one of the great successes of the year."

TALES OF THREE GARDENS AND $300

A $100 vegetable bill for the season, seems rather steep *when you have to pay it:* yet you are liable to lose sight of its importance when you save that much by raising your own vegetables. The amount carries added weight as the area from which it was derived and the corresponding debit sheet diminishes. I recall three vacant lots 70 x 125 feet, 80 x 100 feet, and about 70 x 200 feet respectively, on each of which $100 worth of vegetables was raised.

The total outlay for the largest was $10, itemized as plowing $2.25, clearing $3, bean trellis $1, seeds, etc., $3.75. An original method of supporting pea vines was practised, three light wires being strung on stakes, and "dry horse-weeds" being woven in to form the support. The best results were from early potatoes, of which 40 bushels were raised from 1½ bushels of seed. From products sold there was obtained a net profit of $10, aside from the family's supply which brought the value of the garden up to $100.

WHAT THE MAN "WITHOUT ANY TIME" CAN DO

Notwithstanding the scarcity of time by which the average business man is handicapped, one individual managed to get three crops from part of his 80 x 100 foot garden. This section was, early in the spring, planted with early, medium and

late varieties of potato, which brought in $30. When cultivation was discontinued corn was planted between alternate rows, the vines of the intervening rows being laid together. The potatoes were removed by August 6, when half the plot was sown to turnips, the rest to rye, which was to be used as winter chicken food. Just a suggestion of gardening possibilities is furnished by the pumpkin crop. Three seeds were planted, and the yield consisted of twenty-one excellent "fruit." It almost makes me tremble to work out the percentage of profit in this case, but it is legitimate gain, nevertheless. The total credit sheet for this garden is given as follows:

Grapes	$ 25.00
Sweet potatoes	5.00
Green beans	5.00
Cucumbers	2.50
Pumpkins	2.60
Lettuce	1.50
Chicken greens	2.40
Potatoes	30.00
Green corn	10.00
Tomatoes	10.00
Turnips	3.00
Radishes	1.00
Onions	2.00
Total	$100.00

A NEW CHAPTER IN THE "BOOK OF FRIENDSHIP"

A touch of what might be called the romance of gardening is conveyed in the history of a coöperative vegetable growing scheme. Also it disproves the thought that more than two heads always make

"too many cooks." The work was not attended by any excess of encouragement, either, for when the plan of a coöperative garden worked by three neighbors was broached to an advising authority, he pessimistically prophesied a breach in the friendly relations between the three before the season was over. How far this was from the actual results, can be inferred from the following:

"In the spring of 1907 we secured, rent free, two lots, measuring altogether 70 x 125 feet, located close to our respective homes. After clearing the ground of an accumulation of ashes, tin cans and other rubbish, the ground was plowed, harrowed and fenced on three sides. The fence was made of 2 x 4s and 4-foot chicken wire. On the fourth side was a neighbor's fence.

"My two associates knew absolutely nothing about gardening, so that the directing and planning fell upon my shoulders. By the aid of *The Garden Magazine* a complete plan of the whole garden was drawn to scale and the times of the various plantings marked. The lot faced the east, so the rows were run north and south, the tall growing vegetables being kept at the back, the shorter ones next, then a narrow flower bed and a grass plot seeded in front the same depth as the neighbors' lawns. The wire fence came only as far as the grass, and was on a line with the front of the houses on the street. A clump of Golden Glow roots was planted by each post all around the garden.

"The grass plot in front, the narrow strip of annuals, the clumps of Golden Glow around the

whole garden, the successive rows of variously colored vegetables, each a little taller than the ones in front, with giant Stowell's Evergreen corn for a background, made a beautiful picture from the street. Although the garden was purely a vegetable one, the general appearance and the narrow border of flowers won for it favorable mention in a flower garden contest covering the whole city.

"Up to the time when the seeding was finished it was one garden, each man helping to the best of his time and ability under proper direction. At this time the garden was divided into three equal parts by two rows of stakes from front to back and each gardener was responsible for his own plot, and had to do his own cultivating, watering, and gathering.

"The cost the first year was:

Plowing and harrowing	$ 4.00
Fence posts and wire	8.00
Fertilizer	5.00
Seeds	8.00
Total	$25.00

"From this vegetable plot of 70 x 100 feet, exclusive of the portion planted to flowers and grass, we estimated that at current prices for wilted store vegetables, we took about one hundred dollars' worth of the most delicious vegetables one could desire.

"In 1908, not having a fence to pay for, a combination wheel hoe and seeder was purchased, which lightened our labor and made a heavier and more uniform yield. The struggle with weeds was not so great as the first year, for many years previous

to our breaking sod a magnificent crop of shoulder-high weeds had flourished.

"In the third season, 1909, the personnel of the partnership was changed, two members having moved from the city, but two other friends took their places, with just as gratifying results. Contrary to the prophecy, our friendship has been cemented, rather than broken, by our coöperative digging, hoeing, watering, and harvesting."

TRANSPLANTING; ONE WAY TO SAVE SPACE

I have already mentioned the value of a hotbed for summer use in raising plants later to be set in empty rows. For want of a hotbed, any small plot in the garden may be used as a seedbed when the days become warm, providing the soil is kept in excellent, fine condition. Tomatoes, lettuce, egg-plant, and the cabbage family are especially adapted to this filling-in system, but I note in the records of one 15 x 30 foot garden that cucumbers, squash, bush beans and kohlrabi were also treated in this way. A plot as small as that is within almost any one's reach, as is also the ten minutes a day that was needed to care for it. Whether similar results are as available must be determined by your energy and your individual application of up-to-date methods. This is another garden in which the moving spirit was a woman. Her account of the season's work is as follows:

A TEN-MINUTE-A-DAY GARDEN

"Many possessors of small pieces of ground never think of raising their own vegetables because they

imagine that in order to make vegetable-growing worth while, a half-acre plot and a man to work it are necessary. But I know differently. For on a garden spot, measuring fifteen by thirty feet, and with only ten minutes' work a day, we grew twelve dollars' worth of vegetables. There were twenty kinds and each planting yielded enough at a picking to supply a family of five grown persons. The seed cost less than a dollar; except in cases where we knew the actual value, we have reckoned it as one cent, because the quantity necessary was only a small portion of a five or ten cent package. *One week's picking alone would more than equal the entire cost of seed*, as the following table shows:

LARGEST PICKING FOR ONE WEEK, JUNE 14 TO 20

Parsley	$ .20
Peas	.25
Carrots	.25
Chard	.10
Lettuce	.45
Beets	.05
Total	$1.30

LARGEST PICKING FOR ONE DAY, SEPTEMBER 14

2 quarts Limas	$.10
1 quart pole beans	.05
2 quarts parsley	.10
3 ears corn	.05
9 carrots	.05
8 cucumbers	.20
9 tomatoes	.05
Total	$.60

"Our first thought was to plant the rows north and south in order to get the full benefit of the sunshine. Next we arranged rows of three different lengths — thirty feet for those vegetables of which we wanted the largest possible quantity, twenty feet for others and ten feet for the sorts that would yield a sufficient amount from a small space. In every case where it was possible, a succession or doubling-up was done. Sometimes two or even three crops grew on the same line. In the case of the potatoes and corn, alternate hills of the former were promptly dug and the space replanted with a July sowing of corn.

"The 30-foot row of early peas was followed by three crops that made use of the same trellis, each occupying one-third of the row.

"As both onions and parsley are the better for transplanting, the young plants of each simply exchanged locations; the parsley went into the place vacated by the onions and seed of the later crop of onions was sown in the parsley row. In instances where the ground was not to be vacated early enough for the later planting, the sowings of the successive crops were made in odd corners or in flower pots, and the plantlets transplanted as soon as there was a vacancy; tomatoes, cucumbers, squash, bush Limas, kohlrabi and lettuce were treated in this way.

FIVE CROPS ON ONE FOOT OF GROUND

"The trellises and adjacent ground were used for two, three, four or even five crops. One foot from

The space was closely planted and as soon as one crop was gathered another was put in. Details below:

A. Pole string beans and five tomato plants, planted June 2 — B. and C. Onion sets March 31. Second crop, double row transplanted bush Lima beans, June 10 — D. Swiss chard, April 1 — E. Onion seed, March 31, moved June 19. Second crop transplanted parsley, June 19 — F. Transplanted onions May 26 — G. and H. Lettuce, April 12, all out by June 24. Second crop double row transplanted bush Lima beans, June 20 — I. Parsley, March 21, transplanted for second crop kohlrabi.

1. Radishes, March 31, pulled May 12 — 2. Corn May 8, harvested August 29, Second crop transplanted kohlrabi — 3. Beets, April 12, pulled August 8. Second crop was beans, August 19 — 4. Wax beans, May 20, pulled October 21 — 5. Lettuce, a failure — 6. Carrots April 1, pulled October 30 — 7. Potatoes March 31 and April 12; seven hills dug July 1. Second crop, seven hills corn July 1, harvested September 23. Third crop hardy spinach, September 29 — 8. Peas March 31, picked June 24. Second crop cucumbers, five tomato plants, Crookneck squash, all transplanted — 9. Peas, April 28 — 10. Lima beans, May 25 — 11. Radishes, April 12, pulled May 25. Second crop, transplanted lettuce, May 25

the eastern boundary line of the garden was an arched trellis, on the opposite sides of which peas and Lima beans grew. At the foot of the trellis were radishes, and as soon as they were harvested, lettuce plants (that had been started in another part of the garden) were moved in. A tomato plant occupied one of the uprights of this trellis, so that the one-foot strip of ground actually accommodated five crops.

"The 12-foot trellis at the back of the garden has a similar history. It was sowed the entire length with pole beans. At each of the five uprights there was a tomato plant. A lemon cucumber climbed on this trellis, and some asparagus beans, making *four crops at the same time.*

"Sometimes a second crop was sown before the first one was off the ground. This was accomplished by planting the row a few inches away from the old one, and as soon as the latter was removed the young crop had all the room it required and yet had the advantage of several days' start. Double rows are another help to economy of space. Slow maturing crops can be either sowed or transplanted on each side of a row of small vegetables, such as onions, which will be cleared in time for the later crops to fill the space.

"The garden provided for use outside of its own boundaries about three hundred carrot plants, nearly three dozen corn plants, about two dozen Lima beans, and several chard seedlings, all of which were successfully transplanted. It also pro-

vided parsley roots to supply three families for winter.

WHAT YOUR GARDEN CAN GROW

Here follows an exact record of each crop — you can simply repeat all this:

"*Potatoes.*— Cost of seed, ten cents; length of row, twenty feet. This crop was produced from one pound of seed potatoes that made enough pieces to plant a dozen hills, half on March 31 and the rest two weeks later. We preferred earliness to size, and the variety was chosen accordingly, with the result that we were digging potatoes on June 24, by which time they had attained the size of eggs. A week later we dug some that weighed half a pound. Each hill supplied a meal or more, and the last was dug on August 23, so that during the two months we bought no potatoes at the store. We do not use many potatoes, of course, when we get fresh summer vegetables.

"*Onions.*— Cost of seed, one cent; length of row, ten feet. Sown on March 31 and transplanted May 26. This gave a sufficient supply for seasoning, which was all that could be expected from a ten-foot row. The last of the crop was pulled the end of August and kept in the cellar until used some time in October.

"*Parsley.*— Cost of seed, one cent; length of row, ten feet. By a little management the parsley season was extended throughout the entire year. In March some roots were transplanted from the window garden, and some thriving young plants

that had wintered outdoors were moved into place; between them seed was sown to give a succession crop when the year-old plants had run their course. Outdoor pickings were made from March 31 to November 18, and by potting some of the young plants in November we had a house supply for all winter.

"*Peas.*— Cost of seed, twenty-two cents; length of row, thirty feet for early; twenty-eight feet for late. In order to get the longest season of peas from the least outlay of ground, we sowed the earliest kind on March 31 and a late sort on April 28. The former bore from June 8 to 24, and the latter from July 3 to 28.

"*Carrots.*— Cost of seed, one cent; length of row, twenty feet. They had a very long season. Seed was sown on April 1. By June 9 the roots were three inches or more long; the last was pulled on October 30. As with the onions, these were planted for seasoning, but the thinnings gave us several dishes of tender, young carrots. The usual order of things was reversed. Thinning was delayed until the largest were of usable size, when they were pulled and successive thinnings continued as the remainder grew, until the plants stood six inches apart. These were left to mature. In this way we managed to get nearly a hundred carrots to use young, that would otherwise have been destroyed, and all without trespassing on the permanent row. If you have never enjoyed the pleasure of eating very young carrots, do not fail to make the trial this year.

"*Chard.*— Cost of seed, two cents; length of row,

ten feet. A sowing on April 1 gave us greens by the middle of June and stalks a week later. At the end of August, after the crop was past, the roots were pulled out, as their room was more valuable than their company.

"*Lettuce.*— Cost of seed, two cents; length of row, ten feet. This gave us more than a hundred plants. As soon as they reached transplantable size, we set out sixty plants along the Lima bean row, leaving forty in the original row. This was rather crowded for a 10-foot row, but as the first heads were gathered while still quite small there was space for the others to spread. Well-developed heads were ready by June 16 from the April 12 sowing. They were so tender that they fell apart in the handling, and the flavor and quality were excellent.

"*Beets.*— Cost of seeds, two cents; length of row, twenty feet. Sowed April 12, and less than two months later we were pulling young roots the size of plums. These thinnings were good eating and they left space for the others to spread, as they attained full size, during the month following.

"*Corn.*— Cost of seed, fifteen cents; length of row, thirty feet, early; seven hills, late. The first planting, May 8, came up so thickly that we transplanted all that could be accommodated on another part of the grounds, and still had a quantity of thinnings to feed to the horse. The original row yielded seventy ears and the transplanted hills about fifty more. The bearing season lasted a month, from the end of July to the end of August. The late corn was sowed July 1, where the potatoes had been taken

out, and gave us two dozen ears about the middle of September.

"*Wax Beans.*— Cost of seed, five cents; length of rows, forty feet. The early planting was made May 20, and was in bearing from July 8 till past the middle of August, and after that, scattering till frost. The late planting was made August 19 and, as bad luck would have it, had just reached the pickable stage when frost destroyed it.

"*Bush Lima Beans.*— Cost of seed, one cent; length of rows twenty feet. The cost of this seed is not worth computing, as the plants were thinnings from another part of the garden and would have been destroyed had we not transplanted them.

"*Pole String Beans.*— Cost of seed, three cents; length of row, twelve feet. These did themselves credit. Sowed June 3, they had reached the top of a 6-foot trellis by the middle of July and began to bear a week later. They did not yield any large pickings until the middle of August, but after that covered themselves with glory, and on September 6 a picking of three hundred pods — about four quarts — was made. After that time they bore in small quantities until frost.

"*Pole Lima Beans.*— Cost of seed, eight cents; length of row thirty feet. These were sowed on the east side of a trellis, the west side of which was covered with pea vines. The latter had a month's start and by the time they were out of the way the beans were ready to occupy the whole trellis. We sowed an early kind on May 25, and they came up so thickly that we transplanted about two dozen

young plants. Although it was done after they had several inches growth of vine, they flourished and more than paid for the risk. The Lima crop ripened August 1 and continued to yield till frost.

"*Cucumbers.*— Cost of seed, one cent; four hills. These replaced the early peas. They were started in another spot and transplanted when the ground was ready for them. Naturally they were somewhat late, but otherwise were all that could be desired. Two kinds were grown, the Japanese climbing and the lemon.

"*Squash.*— Cost of seed, one cent; two hills. The history of the squash is the same as that of the cucumbers, as they were started and transplanted to cover another portion of the vacated pea trellis.

"*Tomatoes.*— Cost of seed, one cent; ten plants. The tomatoes were kept in flower pots until the pea ground was cleared when they were set out to fill the remaining third of the trellis. Five plants had already been transplanted to the pole bean trellis on June 2, and these later ones, moved on June 20, made the total eleven plants. There were four varieties; Freedom, Ponderosa, Golden Sunrise, and a solitary plant of Yellow Cherry on the trellis. All proved satisfactory and gave good yields. From the eleven plants we gathered more than two hundred large tomatoes and nearly two hundred of the Yellow Cherry. Green ones, used for pickles, are included in the number. The five tomatoes on the pea trellis bore almost forty pounds of fruit. We extended the season by keeping some plants under cover when frost threatened.

"The exact return from our 15 x 30 ft. garden will be better appreciated if stated in tabular form. We had the greatest value from the garden in August, naturally, and the returns before May and after October were nominal.

TOTAL YIELD, RECKONED BY MONTHS

May. — Radishes	$ .20
June. — Lettuce over a dollar, peas and carrots also plenty	2.95
July. — Peas, wax beans and lettuce, the chief crops	2.10
August. — Corn, Limas and chard bring up the total	3.30
September. — Cucumbers, corn and squash make over half this amount	2.70
October. — Mostly tomatoes	.80
Before May and after October. — Parsley	.50
Total	$12.55

TOTAL YIELD RECKONED BY VEGETABLES

Potatoes	$ .50
Onions	.20
Radishes	.10
Parsley	.80
Peas	1.10
Carrots	.75
Chard	.60
Lettuce	2.00
Beets	.50
Corn	2.00
Wax beans	.50
Bush Limas	.30
Pole string beans	.60
Pole Limas	.65
Cucumbers	.80
Squash	.30
Tomatoes	.85
Total	$12.55

The * shows the months in which the vegetables were in use.

VEGETABLE	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Potato				*	*	*	*					
Onion					*	*	*	*				
Radish			*									
Parsley	*	*	*	*	*	*	*	*	*	*	*	*
Peas (2 kinds)				*	*							
Carrots				*	*	*	*	*	*	*	*	*
Chard				*	*	*						
Lettuce				*	*							
Beets				*	*	*						
Corn (2 kinds)					*	*	*					
Wax beans					*	*		*				
Bush Limas						*	*	*				
Pole string beans						*	*	*	*			
Pole Limas						*	*	*				
Cucumbers (lemon and Japanese)						*	*					
Spinach							*	*				
Tomatoes (4 varieties)						*	*	*	*			

"Parsley and carrots were housed for winter use, so we have given them credit for bearing during the winter months."

COMBINING SUCCESSION AND ROTATION

Just one more word about succession planting — do your best to combine rotation with it. That is, if a first crop of roots is bothered by the maggot or club root, let the succeeding crop be one of beans, peas, corn or some vegetable that is *not subject to attacks by the same enemy.* This will not be difficult

if you get a clear idea of the different groups or types of vegetables. These consist of (1) the legumes, or beans and peas; (2) the brassicas or radish, turnip, cabbage, cauliflower and kales; (3) the cucurbits or gourds, including squash, melon and cucumber; (4) the leaf crops, lettuce, spinach, endive, etc.; (5) the heat lovers such as tomatoes, eggplant, peppers; (6) a few unrelated sorts including celery, corn, beets, etc. Each of these groups is likely to have a disease or an insect enemy of its own, but these can usually be starved out by furnishing only uncongenial food in the shape of vegetables of another class. Moreover in new land, such as you are likely to till in the backyard, insect pests are uncommon and probably will not trouble you. An excellent arrangement of this sort, as well as a simple system for keeping track of it is included in the management of another successful garden, of which the chief features are worth citing.

The garden will work overtime if you keep up a quick succession of crops. The early maturing kinds must be kept apart from those requiring the whole season in which to mature, and the ground replanted as the quick-growing crops come off. If parsnips or salsify are planted with lettuce or beets the plot is badly broken up when the latter are harvested, so that it never has a neat appearance through the year.

Lettuce can be planted successionally in the same ground, and the last crop will be just as good as the first so long as the ground is kept fertile. It would be foolish to plant turnips where radishes had been

harvested. The same maggot affects both, and, although the first crop was but slightly touched, the second one might be rendered practically useless, as the insects increase very rapidly. Potatoes and beets are attacked by the same scab, so the one should not follow the other. None of the brassica (cabbage) family should be used to succeed one another, as the same insect attacks them all.

A SUCCESSION PLANTING SCHEME

The succession arrangements for a garden are told in the following planting scheme by plots in the actual record of a recent season.

Plot No. 1.— Planted with parsnips and salsify April 15. No succession crop, as these take the whole season to mature.

Plot No. 2— Lettuce and radish. The former set out from the greenhouse on April 15, radish sown on April 6. Both harvested May 28. Eggplant and peppers planted June 1 occupy the ground the rest of the season.

Plot No. 3.— Spinach harvested June 10. String beans planted June 12 will be harvested August 14. Sow Yellow Stone turnips August 16 for winter use.

Plot No. 4.— String beans planted April 18 are harvested June 28. Sow to winter carrots July 1.

Plot No. 5. — Early corn planted April 17 is harvested July 23. Planted to winter celery July 25.

Plot No. 6.— Early peas sown April 6, harvested June 18. Sow late corn June 20.

Plot No. 7. — Early beets sown April 8; harvested June 16. Lettuce transplanted June 18; harvested August 1. Sow string beans August 3.

Plot No. 8.— Lettuce sown April 8; harvested

Salsify or vegetable oyster. It is surprising how many households do not know this delicious, easy-to-grow, vegetable. Treat it just as you would parsnips

June 10. Beets sown June 13; harvested August 10. Last sowing of corn July 13.

Plot No. 9.— Early carrots sown April 8, harvested June 25. Planted in cabbage June 27.

Plot No. 10.— Early cabbage planted April 14; harvested June 15. Purple-top turnips planted June 17; harvested August 18. Sown in winter beets August 20.

Plot No. 11.— Early turnips sown April 6; harvested June 15. Lettuce sown June 18; harvested August 20. Sown spinach August 22.

Kohlrabi—easier to grow than turnips; it matures quicker, is more tender and delicate, and is practically free from insects and diseases

Plot No. 12.— Peas sown April 20; harvested June 23. Endive sown July 2.

Plot No. 13.— Corn sown May 10; harvested August 15. Sown lettuce August 17.

This kind of succession kept the ground busy, there being allowed only enough time between planting properly to till the ground. It was dug over, trenched and fertilized for each new crop.

Swiss chard—a near relative to the beet—though no one would guess it. According to how you cook it, it exhibits the good points of spinach, cabbage, beet-greens and kale

There were about three crops of each throughout the season. The usual thing for the amateur is to have only one crop, and if he succeeds in getting a second he feels quite proud.

In Plot No. 1, mentioned above, the wisest plan would have been to leave the roots in the ground until hit by a good stiff freeze. The flavor of parsnips and oyster plant is greatly improved by frost, as is also that of kale.

EXPLORING THE UNKNOWN: A PLEA FOR UNFAMILIAR VEGETABLES

And speaking of oyster plant and kale, don't fail to grow these vegetables even if they are strangers. Or at any rate give them a trial, and find out whether you like them. I have been surprised to find how little known the delicious salsify or oyster plant is in some places. Kohlrabi is another "novelty," which ought to be given a regular place in the garden. It is more delicate than the turnip, matures more rapidly, and, having its fleshy body above the ground is practically free from insect injury. Swiss chard is a welcome change from spinach and cabbage, and is just as easy to grow. Of course, I do not suggest letting these newer plants crowd out the old standbys, without which the garden would be as a song without music; at the same time I do urge you to find some place for them — to make a little experimental or testing-out bed in the garden, where you can develop new treats for an educated taste.

BOYS — AND GIRLS — AND GARDENS

The garden is the place to keep busy the boys and girls, too, where they can make some pocket money without having to sell papers or dig dandelions out of the neighbors' lawns. Witness the children's gardens

that are being instituted in many cities, and get some one who is directly interested in one of them to tell you whether they are welcomed or not. Nature Study is one of the biggest advances in modern educational methods. *You* can provide material for this work for your own children, and gain at the same time all the financial benefits that I have spoken of on other pages. Wouldn't you like to talk to the 14-year old boy who cleared nearly $50 from half an acre? At any rate you can hear his story and I'd not be surprised if you were to profit by it.

A FOURTEEN-YEAR-OLD-BOY'S GARDEN THAT PRODUCED $70

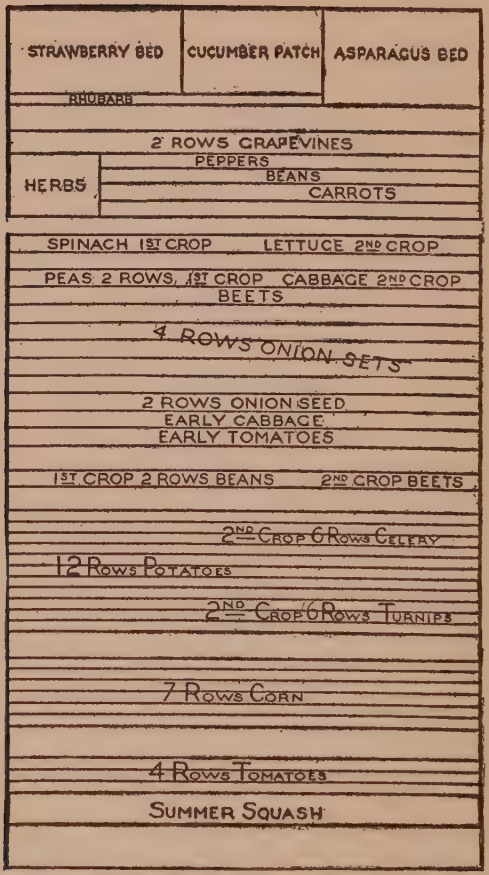
"My garden is half an acre, sloping slightly to the south, and I do all the work myself except plowing and hauling the manure. The soil is a rich, sandy loam. After sending my order to the seedsman I had manure hauled and spread all over the garden to be plowed under. On April 5 the garden was plowed, harrowed, and the potato rows marked out. I then planted my peas, beets, early potatoes, spinach, onion sets and onion seed. I worked in the garden every day after school and soon had it looking tip-top. About the first of May I planted all the other vegetables that could not be planted early, such as corn, beans, late potatoes, summer squash, early tomato plants, cabbage plants, carrots and pumpkins. I had the asparagus and rhubarb to supply early vegetables. I picked my first spinach on May 12 and my first

peas on May 28. On June 27 I picked corn, which was 'Peep o' Day," and certainly was sweet. From May 15 until October my garden supplied a family of nine with vegetables. I dug my first potatoes on June 29, and they were beauties —no scabby ones and very few little ones. I got fifteen bushels. The following table shows my gain, *actual sales:*

Tomatoes, 20 bushels at 35 cents per bushel	$7.00
Potatoes, 15 bushels at 60 cents per bushel	9.00
Onions, 4 bushels at 80 cents per bushel	3.20
Peas, 6 bushels at 80 cents per bushel	4.80
Beets, 30 bunches at 3 cents per bunch	.90
Asparagus, 15 bunches at 12 cents per bunch	1.80
Rhubarb, 30 bunches at 4 cents per bunch	1.20
Lettuce, 50 heads at 3 cents per head	1.50
Celery, 200 bunches at 4 cents per bunch	8.00
Beans, 24 bushels at 40 cents per bushel	9.60
Spinach	.70
Squash, 20 at 3 cents each	.60
Pumpkins, 14 at 5 cents each	.70
Eggplant, 6 at 5 cents each	.30
Peppers, 2 packages at 20 cents each	.40
Carrots, 2½ bushels at 60 cents per bushel	1.50
Radishes, 6 bunches at 2 cents per bunch	.12
Turnips, 3 bushels at 20 cents per bushel	.60
Corn, 90 dozen at 18 cents per dozen	16.20
Lima beans, 2 bushels at 80 cents per bushel	1.60
Cabbage, 60 head at 3 cents per head	1.80
Total	$71.52

EXPENSE

Cost of seeds	$10.28
Cost of plowing	2.50
Cost of manure	5.00
Cost of celery plants	4.00
Total	$21.78



The half-acre plot on which the fourteen-year-old gardener raised over $70.00 worth of crops

RESULTS

Total sales	$71.52
Total expenses	21.78
Net gain	$49.74

"The prices represent what I sold the vegetables for to my mother and neighbors. I raised all my own tomato, cabbage and pepper plants in a 6 x 8 coldframe that I made. The following table shows when I planted the vegetables:

March 10, (in coldframe). — Tomato seed (Earliest of All); cabbage (Flat Dutch).

April 5. — Two rows peas (Earliest of All); one row spinach; one row Market Gardener's beets.

April 6. — Four rows onion sets (Prizetaker); two rows onion seed; twelve rows Early Rose potatoes.

April 29. — One row cabbage plants; one row tomato plants.

May 1. — Two rows beans; one row corn (Peep o' Day); six rows carrots.

May 2. — Summer Squash; twenty-eight hills White Spine cucumber.

May 4. — One row pepper plants; one row beans.

May 5. — Two rows of corn.

May 7. — Four rows tomatoes (two rows Stone, two rows Earliest of All).

May 14. — Four rows corn (Country Gentleman).

June 8. — Two rows late cabbage; one row lettuce.

July 2. — Two rows beets.

July 18. — Six rows celery (White Plume).

July 19. — Six rows turnips (Purple Top).

August 4. — Corn patch sown in crimson clover to be plowed under for next year's potatoes."

From another garden of some 700 square feet, from which was obtained a profit of over $24, I have learned a simple method of outwitting the cutworm family. If they begin to bother your garden, get strips of tin or stiff, strong paper about six inches wide and some 50 inches long. Bend these into circles and place them over your melon, squash and

Protecting hills of melons or squash from cutworms with pieces of tin, cardboard or stiff paper

cucumber hills, forcing them into the soil for about two inches. Flying insects could be rendered harmless by throwing a piece of old wire or cloth netting over the tops of these fences. These screens can be removed when the vines grow over the fences; the latter do no harm if left all season and often spoil the attempts of late appearing worms.

THE THOROUGH GARDENER AND HIS REWARD

Another bug-evading policy practised by some is to plant a few beans or unimportant seeds near the valuable crops, and by leaving these unsprayed, give the insects something to feed on, so that they will leave the others untouched. Personally, I don't

care for this bargaining method — I had rather wipe out the insect enemies with arsenate of lead and the oil-emulsions, particularly since the latter are so easily used and so effective. But it is a significant fact that in nearly every well-tilled, well-cared-for garden, the enemies, both insects and diseases are discovered at all only with considerable effort. Do you draw any conclusions from this, or make any resolutions?

THE NEED OF GARDEN RECORDS

No farmer that you ever heard of, or anyone else, and who was a *real* farmer, successful, progressive, businesslike, ever tried to do without detailed records of each crop. Now since you are going to turn farmer on a small area, where every condition is favorable for far more intensive methods than he can hope for, what excuse is there for *your* not keeping a record? And, in proportion, a more intensive record than the general farmer can expect to keep? Not one memory in five hundred is able to keep track of the dates of plowing, cultivating, sowing, spraying, transplanting, pruning and harvesting every crop in the garden. Without such a history, your efficiency next year, your chance to increase your results and improve the plan of your garden will be reduced tremendously.

CAN YOU DEVISE A BETTER ONE?

To look at it from the other direction, if you *do* keep a garden diary, every year will bring you more

bountiful crops, better, more perfect vegetables, and reduced labor programs and expense accounts. One of the best proofs of this, and also one of the simplest, most practical, and comprehensive systems of keeping records, that I have ever seen, has now become an institution in the practices of its originator. I say it is the best I've seen, but I'm open to conviction if you can make use of it, and invent some improvements. Notice the returns that one season produced where this method is used. *Six hundred per cent. from one-tenth of an acre!*

A VEST-POCKET GARDEN RECORD SYSTEM

"The reasons why ordinary systems fail are two. (1) You can't get a big yield without fertilizing and there is no way to learn how to fertilize except by *experimenting.* (2) You can't economize space unless your crops follow one another without the loss of a day and there is no way to get the necessary dates except by *experimenting.*

"My garden contains about one-tenth of an acre and it grows all the vegetables (excepting late potatoes) needed for a family of five adult persons. Last year was the fourth of its existence, and each year has shown an increased yield which was made possible only by keeping a record of each year's work and making use of this in planning the succeeding year's garden.

"The garden's daily progress is recorded in a small book (2½ x 4½ in.) that can be carried in the vest pocket, and is always handy. The pages

are arranged in the form of a table, usually with only one kind of a vegetable on a page, yet so arranged that the same book can be used three years. The entries are made in pencil and at the end of the year they are copied in ink into a much

15 - TOMATO Variety	Sow	Sp	T	3 Pot	4 Pot	PLT	Blos	T	Ripen	T Blos	T Seed	Done	# Plts	Remarks.
Barlow Pink	2/10	2/14	4	3/10	4/1	5/11	5/16	94	7/2	47	1/42		6	
YIELD - 1 9/10														
B. Jewel	2/10	2/14	4	3/10	4/1	5/11	5/9	87	7/4	56	1/44		6	
- 11 9/10														
Barlianna	2/10	2/14	4	3/10	4/1	5/11	5/7	85	7/4	58	1/42		6	
- 1 9/10														

12 PEAS Variety	Sow	Sp	T	Blos	Use	T Blos	T Seed	Done	T Used	L	Yield
Surprise	4/17	5/2	15	5/26	6/9	14	53	9/20	11	104	
Profusion	4/20	5/3	13	6/6	6/28	22	69	7/8	10	104	

4½ in.

Two sample pages from the record book by means of which closer cropping was made possible

larger book — one that will last for a number of years, so that the records for a series of years may be seen at a glance. Both books are indexed.

"Sample pages are reproduced in part herewith. The first is the record of an early tomato. The page number appears in the upper left hand corner. In the first column the variety of the vege-

table is placed. Abbreviations are used to mark the columns as follows:

Sow — Meaning the date seed was sown.
Sp.— The date seed sprouted.
3. Pot — The date plants were taken from flat and put into 3-inch pots.
4. Pot — Date of shifting into 4-inch pots
Plt.— The date of planting outdoors.
Blos. The date of first blossoms.
T.— The time elapsed from seed-sowing to blossom.
Ripen.— The date of ripening.
T. Blos.— The time from blossom to ripening.
T. Seed — The time from seed to ripening.
Done — The date of last picking.
No. Plts.— The number of plants of the variety.
A space on the extreme right is left for remarks.

"Immediately below the line on which these records are kept is one for yield. The mark, four upright strokes crossed by another, represents five tomatoes picked: the fraction 7/25 is the date placed in the row, July 25, and is inserted to show how the crop came on. After September 10 tomatoes were measured. In the record of the peas the last column is marked L and gives the length of the row in feet. In recording vegetables by measure the X is used to represent one peck, each leg being one-quarter of a peck. Each vegetable has a table arranged on this general basis to suit its needs.

"By keeping a record I am able to estimate, almost to a day, when anything planted will be ready for use, and also — and this is very important — when it can be cleared away to make room for a succession crop. Although some things planted may be almost failures, yet the total value of the

yield from a small garden may still be large by careful planning, planting another crop as soon as one is cleared away. In other words, do not let the ground remain idle. By this means, too, the garden is always presentably neat and in order, never an eyesore with old plants, vines, etc., disfiguring it.

"An almost perfect succession is the total result of my three years' records. The plan on page 97 shows that the larger part of the garden yielded two crops. A 4-foot space along each fence line contains a row of berry bushes planted last year and set eighteen inches from the fence; also a shallow gutter fifteen inches wide used as a path, which also gives room in which to turn, but may be shortened if necessary.

"At the rear there is a row of rhubarb plants set eighteen inches from the fence. Two and a half feet in front of this is a row of asparagus, the roots set eighteen inches apart; another row of asparagus is to be planted two and a half feet from the present one. The remaining sixty-two feet is divided into two unequal portions. All vegetables of the same family are grown in the same portion, the position of these portions being changed each year, so as to get a rotation.

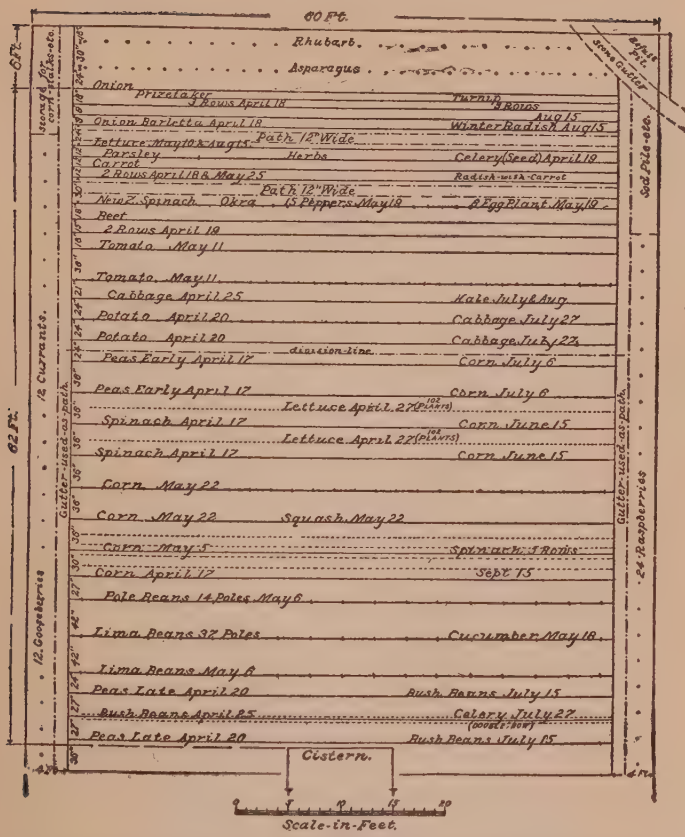
"In deciding on the distance between both rows and plants the effort has been to give the plants room properly to develop, yet to have them so that when grown the foliage will completely shade the ground, and thus lesson the labor necessary for their care. Paths one foot wide are left between

the beds of small vegetables, so that the beds can be seen to, the crops gathered without unnecessary trampling of the ground.

EARLY PLANTS WITHOUT A HOTBED

"All such plants as lettuce, early cabbage, parsley, eggplant, pepper and tomato are grown from seed; the tender ones in the windows of the house, the hardy ones in the laundry, which has sash on two sides, but no means of heating. After March 7, the hardy plants do very well here; on cold nights they are covered. These home-grown plants are better than the wilted bought ones; also I know they are of the desired variety, and for a very small outlay in cash I get a great number. The early plants grown in the house last year were six eggplants, sixty-eight tomatoes and fifteen peppers; in the laundry, thirty plants of cabbage, twenty-four of parsley, and over two hundred lettuce.

"The tomatoes are grown on an upright trellis. The plants are set eighteen inches apart in the row, and trimmed to two stems, all side shoots being cut off as soon as they start. The first ripe tomatoes were picked July 2. Three varieties of early tomatoes were grown, six plants of each. Chalk's Jewel gave me the greatest results out of the five varieties that I have tried during the last three years. The scarlet fruits are smooth, solid, medium sized, and of excellent quality. For late tomatoes, Stone and Matchless were grown. Both are excellent; it is difficult to choose between them.



On this ingenious chart, solid lines are rows; dotted lines mark successive crops when spacing was changed; marks on lines show distances between plants. The names and dates of first plantings are in the left-hand column; those of successive plantings in the right-hand column

"Previous to the first killing frost all green tomatoes were picked from the vines, the small ones used

for pickles, and the large ones stored in a dark place where they kept ripening until December 18.

"The first early cabbage was ready for use July 10. I had twenty-five good heads from thirty plants set out. Kale follows early cabbage, and is transplanted into the rows as fast as a cabbage is removed, and set so as to come between the cabbage plants. Two sowings of kale are made, one about June 6 and another July 6, so as to always have young plants ready. Kale needs frost to make it good. It was used until February and the young growth, made in the spring before the ground was plowed, was also used. The early potatoes were dug July 20.

BIG RETURNS FROM EIGHT DOLLARS

"All my crops are planted in straight rows, for easy cultivation with a wheel hoe. In fact I could not take care of this sized garden without that tool, as all the work is done by myself either in the morning before going to work or in the evening after returning home.

CUTTING DOWN SEED EXPENSE

"The annual cost of seeds used is really very small, for taking advantage of the fact that their vitality extends over a period varying from one to ten years, they are bought in larger quantities than needed for one year — indeed in many cases this is unavoidable, and instead of throwing out the

remains of a single packet of seed, the surplus is kept on hand. Thus, for example, my Chalk's Jewel tomato has been grown from the same packet of seed for three years and germination was as strong last year as it was at first. The yearly average seed expense is kept below three dollars and my total outlay in money is less than eight dollars, made up thus:

COST PER YEAR

Value of seed used	$2.82
3 loads of manure at $0.75	2.25
Plowing and harrowing	1.50
50 lbs. bone meal	1.15
Total	$7.72

MORE THAN 600 PER CENT. RETURN

"The produce of the garden was estimated (by careful records kept all the season), to be $51.59. This does not include such items as the herbs, parsley, etc., a number of vegetables of which no estimate can be made, such as kale, New Zealand spinach, green tomatoes picked before frost, five rows of spinach, and a large quantity of rhubarb which was freely used and of which I have fifteen quarts canned for winter use."

HOW TO MAKE THE GARDEN-PLAN PRACTICAL

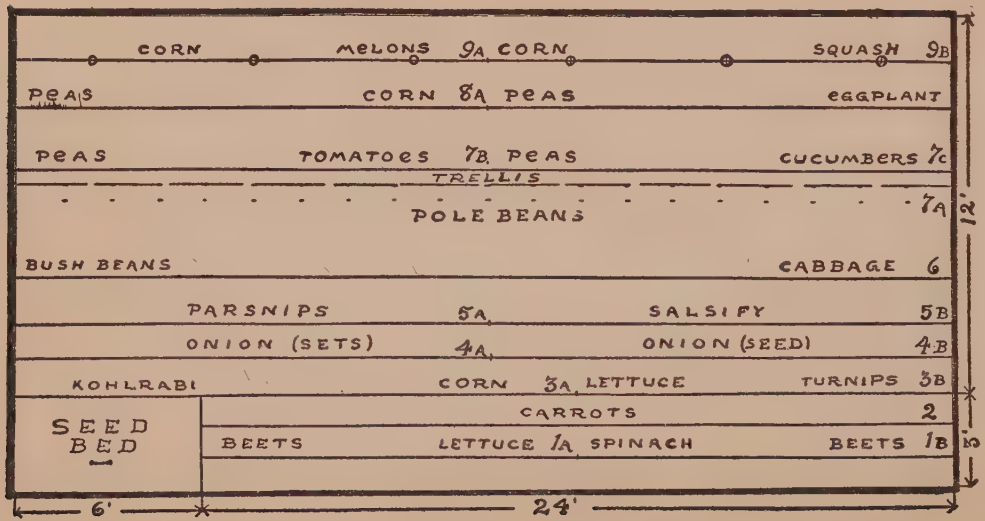
The accompanying plan on page 97 illustrates one method of arranging for several crops on one

space. Another way to accomplish this, is to make two maps or plans, exactly alike, indicating the rows, distances, etc. On the first you can enter the first and all-season crops; on the second, the succeeding or companion crops. You can thereby show exactly the same areas, occupied by two crops without confusing or crowding the writing.

COMPLETE CULTURAL DIRECTIONS IN TABULAR FORM

I have included in Chapter V, the details in regard to all the crops for each month of the year. From this and from whatever sources you may elect to use, such as catalogues, your own experiences, etc., you will probably construct a planting table of your own.

But for the novice who has yet no experience, and who has no objection to getting complete information from one book, I add a detailed planting table for vegetables. Follow it closely as long as you can evolve no better, quicker, more efficient method. But when you find that you can plant a little earlier than is prescribed, or a little closer; when you discover a more convenient way to train tomatoes, or to blanch celery, then make the most of your improvements, and help others to do the same. Leave the ranks of those that follow and are helped, to become one of the leaders, the teachers, the helpers. The step is not so long. You can make it. Try.


CORN
MELONS 9A CORN
SQUASH 9B
PEAS
CORN 8A PEAS
EGGPLANT
PEAS
TOMATOES 7B PEAS
CUCUMBERS 7C
TRELLIS
POLE BEANS 7A
12'
BUSH BEANS
CABBAGE 6
PARSNIPS 5A
SALSIFY 5B
ONION (SETS) 4A
ONION (SEED) 4B
KOHLRABI
CORN 3A LETTUCE
TURNIPS 3B
CARROTS 2
SEED BED 1
BEETS
LETTUCE 1A SPINACH
BEETS 1B
5'
6'
24'

A Planting Table For a

VEGETABLES	REQUIRED				PLANT		
	Feet of Row	No. of Hills or Plants	Between Rows (Inches)	Amount of Seed	What	Where	When
Beans, Bush	30		18	1 pt.	Seed	Row 6	Apr. 20-May 15
Beans, Pole	30	10	18	½ pt.	Seed	4 in. from Row 7	May 20-June 10
Beets (1)	12		12	¼ oz.	Seed	Row 1a	Apr. 1–12
Beets (2)	12		12	¼ oz.	Seed	Row 1b	May 15
Cabbage	30	15	18	Pinch	Seed	Seed Bed	May 15
Carrots	24		12	½ oz.	Seed	Row 2	Apr. 1
Corn (1)	30	15	18	½ pt.	Seed	Row 9	May 15
Corn (2)	15	8	18	¼ pt.	Seed	Row 8	July 10
Corn (3)	15	8	12–18		Thinnings from 2	Row 3a	July 10
Cucumbers	15	3	36–40	½ oz.	Seed	Seed Bed	May 1–10
Eggplant	15	8	18	1/10 oz.	Seed	Seed Bed	May 30
Kohlrabi	12		12	⅛ oz.	Seed	Row 3a	March 31
Melons, Musk	15	3	36	½ oz.	Seed	Seed Bed	May 15
Onions (1)	15		12	½ pt.	Sets	Row 4a	May 15–31
Onions (2)	15		12	⅛ oz.	Seed	Row 4b	April 15–May 1
Parsnips	15		12	½ oz.	Seed	Row 5a	April 1–15
Peas (1)	30		24	1 pt.	Seed	Row 7 by Trellis	March 15–31
Peas (2)	15		18	½ pt.	Seed	Row 8	April 15
Peas (3)	15		18	½ pt.	Seed	Row 9	May 1
Salsify	15		12	½ oz.	Seed	Row 5b	April 15–May
Spinach	12		12	½ oz.	Seed	Row 1b	September 1
Spinach, N. Z.	15		18	½ oz.	Seed	Bet. Rows 6 and 7a	June 15
Squash, Late	15	3		1/10 oz.	Seed	Seed Bed	May 1
Tomato	15	8		1/10 oz.	Seed	Seed Bed	May 15–June
Turnip	15		12	½ oz.	Seed	Row 3	July 1
Lettuce (1)	12	16	12	⅛ oz.	Seed	Row 3b	March 15–31
Lettuce (2)	?	?	12	?	Seed	Seed Bed	April–June
Radish	?		6	?	Seed	Vacant Spaces	Anytime

Vegetable Garden 15 x 30 Ft.

		TRANSPLANT OR THIN			HARVEST	
How	Plants or Seeds Apart (Inches)	To	When	Space (Inches)	First	Remove by
Drills	1½				June 10-30	August 15
Hills	36				July 20	
					Aug. 10	
Drills				3	June 1-10	Aug. 30
Drills				3	July 15	
Drills		Row 6	July 15-30	24	Sept.	
Drills				2	July 15	
Hills	24				July 20-Aug. 1	August 30
Hills	24				Sept. 15	
Hills	24	Row 3a	Aug. 15	24	Sept. 20	
Drills		Row 7b	June 10-15		July 15	
Drills		Row 8b	Aug. 1	24	Aug. 30	
Drills				3	June 1	Aug. 15
Drills	1	Row 9a	June 15	60	Aug. 30	
Drills	1½				June 1-15	
Drills				3	Aug.	
Drills				2	Aug.	
Drills					May 15-30	June 1-10
Drills	1				June 10	July 10
Drills	1				July 4	Aug. 1
Drills				2	July 15	
Drills					Nov.? Apr.	May 10
Drills					July	
Drills	2	Row 9b	June 30	60	Sept.	
Drills	2	Row 7a	June 15	24	Aug. 15	
Drills				3	Sept. 10	
Drills				9	May 30	July 1
Drills	3	Vacant Spaces	When 1 in. high	9	?	?
With Carrots Parsnips, etc				1	3—5 weeks	

KITCHEN GARDEN PLANTING TABLE

A Guide to the Proper Times for Sowing of Various Seeds in Order to Obtain Continuous Succession of Crops.

VEGETABLES in the KITCHEN GARDEN	January	February	March	April	May	June	July	August	September	October	November	December
Artichoke, Fr Globe	4		5	1	1							
Asparagus			5	1	1							
Beans, Broad			5									
" Bush	6	6	6	●	2	2	2	●				
" Pole Lima					●	●		7				
Beets		6	4	4	●	●	●	●				
Borecole or Kale				1	1	1		7				
Broccoli				1	1	1						
Brussels Sprouts				4	1	1						
Cabbage, all sorts		4	4	1	1	1	●		7			
Cardoon				●	●	●						
Carrot	6	6	5	●	●	●	●					
Cauliflower	6	4	4	1	1	1	●					
Celeriac		4	4	1	1	1						
Celery		4	4	1	1							
Chicory, Whitloef				●	●	●						
Corn, Field				●	●	●						
" Sweet				2	2	2	●					
" Pop					●	●						
" Salad				●	●	●	●	●				
Cress	12	12	12	12	3	3	3	3	3	12	12	12
Cucumber	6	6	4	4	●	●		6	6			
Egg Plant		6	4	4	4							
Endive				●	1	●	1					
Kohlrabi	6	6	4	●	●	●	●					
Leek			4	1	1	1						
Lettuce	6	4	4	1	2	●	2	●	7	9		
Melon	6	6	6	4	●	●	●	9	6	6		
Mushroom	10	10	10	10	10				10	10	10	10
Nasturtium				●	●							
Okra			11	11	●	●						
Onions		4	4	●	●							
Parsnips			5	●	●							
Parsley	6	6	4	●	●		●					
Peas			5	2	2	2		●				
Pepper			4	4	4	1						
Potatoes				●	●							
Pumpkin				4	●	●			2	9	9	
Radish	12	12	12	12	3	3						
Rutabaga								●	●	●		
Rhubarb												
Salsify			5									
Sea kale			5	●	●		8	8				
Spinach, Ordinary		6	5	2	2							
" New Zealand			4	4				2	2	8		
Squash			4	4	●	●						
Tomato	6	6	4	4	1			6	6	6		
Turnips			5	5	◎		◎	◎	◎			

Explanation of Signs Used in the Table.

● To be sown in open ground without transplanting. Plants to be thinned out to proper distances apart.

1. Sow on seed bed in garden and transplant into permanent place.

2. Make two sowings in open ground during the month.

3. Make three sowings in open ground during the month.

4. Start in greenhouse or hotbed, and plant out as soon as the weather is favorable and ground dry

5. Sow in open ground as soon as it can be worked.

6. To be grown only in hotbed or greenhouse.

7 Sow in cold frame. Keep plants there over winter with protection. Plant out as soon as weather is favorable.

8. To be grown in open ground and protected with litter during winter

9. Plant in frame, when cold weather sets in, cover with sash mats and shutters, admit fresh air whenever weather with permit.

10. Plant in cellars, barns or under greenhouse benches that are free from draughts, with equable temperature,

11. Few may be started in pots for early and transplanted as soon as ground is warm.

12. Sow every week in greenhouse or frame for constant supply

NOTES.

Egg plant, tomatoes, peppers in early spring should have sufficient heat to grow without check; and grown separate from other and hardier varieties, as cabbages.

For last planting of beans, sweet corn, peas, lettuce, select earliest varieties as for first early plantings.

Salsify and parsnips may remain undisturbed over winter and will be in prime condition, if sufficient protection of litter be give to facilitate digging during severe weather

IV

GETTING THE MOST OUT OF FRAMES AND HOTBEDS

EVERY family ought to have a coldframe because it can gain from four to six weeks on the season of early vegetables, merely by sowing seeds in a coldframe on the first of March. This is indicated in the accompanying table, which shows for each vegetable how much can be gained over the regular outdoor cultivation by the aid of coldframes.

TABLE SHOWING GAIN MADE BY COLDFRAME

SOWN MARCH 1 (In Coldframe)	TRANSPLANTED	READY TO EAT	
		Coldframe	Outdoors
Bean		May 8	June 15
Beet	Mar. 25	May 20	June 25
Cabbage	April 1	June 8	July 1
Carrot		May 15	June 15
Cauliflower	April 1	June 8	July 1
Kohlrabi	April 1	May 15	June 15
Lettuce	Mar. 20	May 1	June 1
Parsley		May 15	June 15
Pea		May 8	June 8
Radish		April 15	May 15
Spinach		May 8	June 15

There are three other reasons why you should have a coldframe:

(1) You can have lettuce, radishes and spinach a good part of the winter.

(2) You can have the choicest foxglove, larkspur and cosmos only by aid of a coldframe.

(3) The highest qualities of pansies, violets, English daisies, polyanthus, and auricula are flowered only in a coldframe, where you may have them between February and April.

Difference between "Hotbed" and "Coldframe." There is often confusion caused by the use of the terms "hotbed" and "coldframe" and directions for their use. The former refers strictly to a pit or box-like structure, covered with glass sashes, and given warmth by fermenting manure under the soil. It is used for starting seeds for early plants; in other words it is primarily a seedbed and not a place in which to mature vegetables. The coldframe is similar in construction but is not heated by manure and contains a deeper soil, richer, and in which plants and flowers can be matured, or kept in a growing condition. The change from the former to the latter could be accomplished by merely mixing the soil and manure thoroughly and, perhaps, removing some of the manure, which for the coldframe must not be fresh or "green". A change in the opposite direction would result if after using a coldframe for fall and winter purposes, you were to run steam-pipes or some other means for heating it into the bed in early spring, as described below, or remove

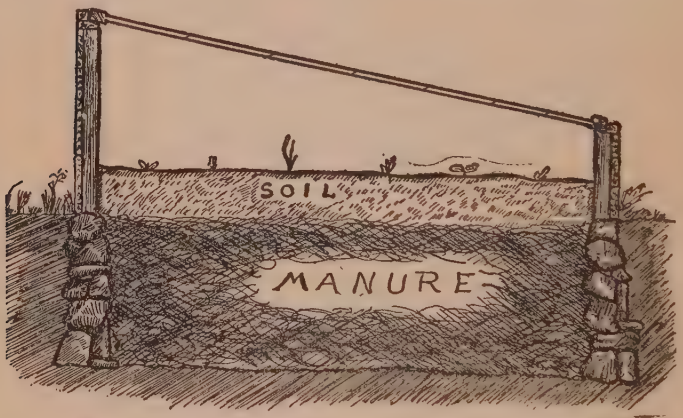
the soil, trample in manure and again prepare a seedbed.

How to Build a Hotbed. Like other things, a hotbed can be built well or just knocked together for the occasion. I favor the former, but for temporary use you can build a cheap one from boards. Dig a hole about three feet deep, six feet wide and of whatever length you think you can afford sash for. Board up the sides, giving the hotbed a height of six inches above ground in front (which, by the way, should be the south side, so as to get the maximum amount of light). The back of the frame should be about six or eight inches higher than the front. Partly fill the hole with fresh horse manure well mixed with some leaves or bedding, and tramp it down well, being sure it is well moistened. Cover with about eight inches of good soil, the top of which should be level with the outside ground. Put the sash in place and wait for the soil to get warm before you sow the seeds.

But if you think you really want a good hotbed, do not build it of wood, as the wood soon decays. A concrete or brick hotbed will last a lifetime. A very good idea in building one on these lines is to have your back or north wall (which should be about four inches thick) rise about two feet above the level of the frame. Carry the ends down on an angle to meet the front line, and you have a very pretty and practical frame. This high back is a wonderful protection for the frames.

If you sow cabbage in February, you cannot

plant it out-of-doors in March, and neither can you leave it in the frame just as you sowed it. The plants will require more room, so therefore do not put all your hotbed down at one time. One or two sash will suffice in which to sow the seeds for a hotbed of twelve sash; so you can see that it would

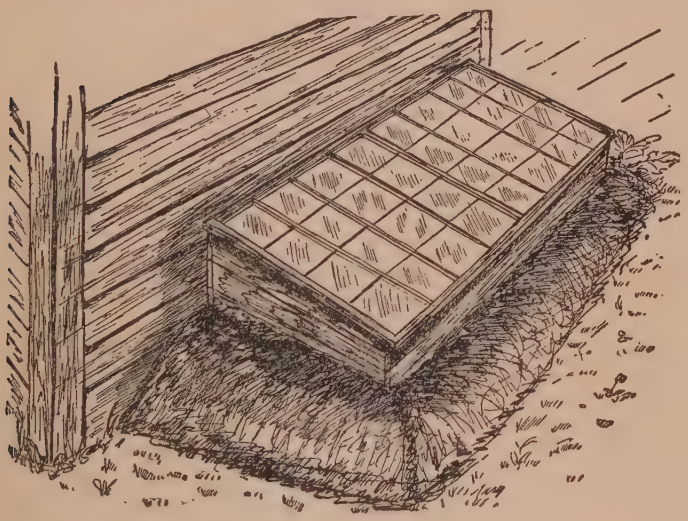


In a permanent hotbed frame the manure pit should be about two feet, and the soil six to eight inches, deep. Brick walls may be substituted for the rock foundation shown above. Always face the high side of the bed to the north

be much more practical to divide the bed in some way.

Here is one way: For a twelve-sash hotbed I would start two sash for the seedlings. I would have five sash ready to take the young plants about three or four weeks later; and about two weeks later I would have the others ready to take the balance, which would consist of slow germinat-

ing seeds. Some folks sow seeds in a hotbed in rows. Other prefer sowing broadcast, and think that their method is the better, for this reason — by taking full advantage of all the room the plants receive the maximum amount of light.



A good location for a temporary hotbed or coldframe is the south side of a building, wall or fence. Pile the manure around the outside of the bed as well as inside it

Mark a space off with sticks, laying them right in the soil; and always wait for the soil to get warm before you sow any seed. This will usually take a few days after the hotbed is made up.

If you haven't any cover for your hotbed you should provide one of some kind. If not a burlap

or straw mat, some straw or leaves will do; but it must be removed on fine days to give the plants air and light. Ventilate the frame a little during the middle of the day on bright days, especially after the seeds have germinated, and never water the young plants in the afternoon, but always in the morning and on a rising temperature. Use a sprinkling can with a fine rose; the temperature of the water should never be lower than 50 degrees. Above all, do not get methodical in your watering and give the plants a bath every day, whether they need it or not. Use a little judgment and do not overwater. For the benefit of the amateur I would say that when plants are small and growing under artificial conditions, there are a great many more killed from overwatering than from not having enough moisture.

A NEW METHOD FOR HARDENING HOTBED PLANTS

The amateur is not unlikely to waste valuable time in fear of freezing his hotbed plants by airing them too much, or too early, or by transplanting them too soon. After the coldest days and nights are passed an excellent means of hardening off the seedlings is the use of cloth sashes. These are made of unbleached cotton or heavy muslin, just as for screens in poultry houses. Some of their chief advantages are (1) the ease with which they are handled, (2) the fact that they do not need to be lifted in order to ventilate the beds, (3) they furnish sufficient shade from even the brightest

sunlight, (4) they lessen the force of rain, yet admit it as a gentle spray, to the plants, (5) they cause stronger, stockier growth, and more vigorous plants than do glass sash, and (6) the seedlings may be earlier transplanted out-of-doors without injury.

HOTBED MATS

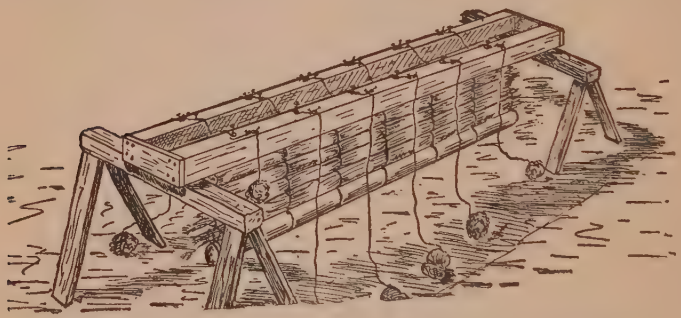
Where hotbeds are used all winter some kind of mat or added protection is essential. Ordinarily, you will be able to find about the house, old carpet, matting, burlap, or bagging which do well enough for one or two sash. When you are growing violets, parsley and other hardy plants, or when you are merely holding over cabbage, etc., four or five inches of loose hay or straw will serve. But this is neither neat, permanent, nor easy to keep on the frames in the face of winter winds, and if you have any spare winter hours, you may enjoy making some real hotbed mats, which will last for several years, are an excellent protection, easy to handle and simple to make. Where long, straight straw is available it is the first choice; but wanting this, you could make a very serviceable mat of hay, or salt marsh grass, overlapping the ends of the bundles and if necessary using more strands of twine. However, if you can get straw, you might just as well follow these instructions to the letter.

A HOME-MADE STRAW MAT

I took two pieces of 2 x 4-inch rough spruce timber, about ten feet long, laid them on the floor,

parallel and about eight inches apart, joining the ends with pieces of 7/8-inch stock, four inches wide.

Starting about eighteen inches from one of the ends of this frame and about an inch from the edge, I drove in six-penny wire nails at intervals of seven inches. Back of these rows and a little to one side, I drove two other rows of wire nails, making rows of cleats on both.



Making straw hotbed-mats on a frame like this is not only a simple, but also an interesting and profitable occupation for winter days

Among the odds and ends of lumber about the place I found a pole such as rugs are wrapped around, which I placed between the outer pieces of the frame.

My first outlay of cash was for tarred marlin, known to the trade as No. 4½. A ball usually contains about 300 feet.

Having decided on the size for the mat, mark off the necessary number of cleats for the width of the mat, allowing for three or four inches of the

straw to extend beyond the outside strings of marlin. For example, for a mat to cover a 6 x 6-foot sash, eleven cleats will be used, giving ten seven-inch spaces. The straw when trimmed, should extend beyond the outside strings of marlin three inches on each side.

To begin operations, cut the tarred marlin into lengths 3½ times the length of the mat. Fold the marlin, to get the centre of the length, and with the centre over the pole fasten it to two opposite cleats. Repeat until you have a sufficient number of strands fastened on the frame. This is the warp in the weaving process. For convenience shorten up the lengths of marlin by making loops on the ends.

With staples, tack the marlin to the pole. Support the frame at a convenient distance from the floor or suspend from a beam overhead. Take a handful of rye straw — the larger the handful, the thicker the mat — and lay it across the strings of marlin, heads toward the middle of the frame; add enough straw to cross over all the strings, and extend beyond the ends about a foot. Distribute the straw so that the strand is of uniform thickness (a 1¼-inch diameter gives a good, heavy mat). Unfasten a length of the marlin—the centre one is the best to start with — cross over the ends, pull taut and fasten again. Repeat, working toward the ends, smoothing out the straw and don't forget that putting the heads and loose ends inside the strand makes a neater piece of work. The weight of the mat as it hangs in the frame

will cause it to stretch, therefore allow three or four extra strands of straw.

When you have woven in sufficient strands finish off, by tying with a square knot the pieces of marlin as you weave the last time.

With a pair of shears cut the projecting strands of straw, to give the sides of the mat a straight edge, leaving a margin of at least three inches beyond the outside strings of marlin. Trim off loose ends and heads all over the mat, and the work is done.

You can determine the best and most convenient size for your own needs, and can make the mat thick or thin as your climatic conditions warrant.

BUILDING THE COLDFRAME

There are, of course, several ways of building coldframes, but the cheapest and best is a brick or concrete frame. Do not build a 2 x 4 ft. frame and expect to raise a wagon-load of seedlings in it. If you crowd the plants you ruin them. Estimate on one sash for every 1,250 square feet of garden space. A garden 50 x 50 feet would need two sash, a garden 100 x 100 feet would need eight sash, and so on, though, of course, it is possible to get along on much less than this. Besides using the frame for raising early spring vegetables, it can be utilized during summer for the long English greenhouse cucumbers or some large thick-fleshed melons; and in fall for radishes, lettuce, etc. You could raise your own eggplants, peppers,

tomatoes, etc., you could have early celery, early cabbage and cauliflower.

While brick and cement are the best materials to use I favor cement because it is cheaper. Any workman can build the forms. There are only two important points in concrete work of this kind to remember: Have the form thoroughly braced so that it cannot move in any way, and have the mixture wet and well mixed. Pound it after putting it into the form until the water rises to the surface.

Always lay out the frame so that it faces south and have it so that the plate that the sash rest on is 6 inches higher in back than in front. Don't butt your sash; use proper sashbars. They come up flush with the sash and are about one inch wide on top. Have the frame one inch longer for each sash it contains. The sashbars can be purchased cheaply and they give a neat finish to a frame. Place buttons on the sashbar which will prevent the sash from blowing off and being smashed or damaged by a windstorm.

Place the frames near enough to the house so that a pipe can be run out from the boiler. This will turn it into a miniature greenhouse for growing lettuce, spinach, etc., during the winter, besides an occasional bunch of flowers. It requires very little heat to keep such a small space up to the growing temperature — about fifty degrees. For the vegetables mentioned a couple of 2-inch pipes would do it nicely. Wherever this is possible I would strongly urge it, as it does away with the

necessity of preparing a hotbed in spring. Another point is the cheaper construction of a frame of this kind. If you heat your frame the walls only need go about six inches below grade level; but if you intend using it as a hotbed in spring, the wall should go down as deep as the hotbed, which would be about two and one-half feet below grade level.

The sum and substance of the relation between hotbed and coldframe is this: if you build a hotbed and do not renew the source of heat (ordinarily manure) *it must eventually become a coldframe.* Now, just as truly as I have said that you cannot get the maximum returns from your garden without a hotbed, I will say that you cannot get the maximum *growing season* and the maximum *growing space* without a coldframe. By a manipulation of these two, closely related instruments, you practically double the space and efficiency of your garden, while you do not increase the time, effort and expense necessary for its care. We can now consider the details of this management, in its relation to the coldframe and the vegetables most adapted to it.

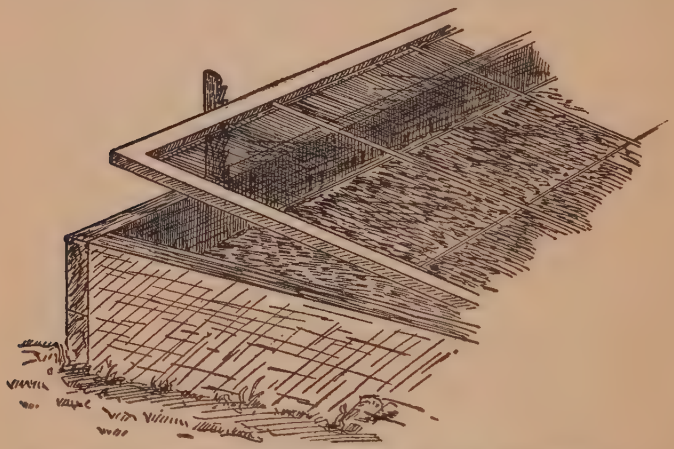
THE ENTIRE MANAGEMENT OF A COLDFRAME

Coldframes can be used to good advantage for a number of early vegetables. A spot that is sheltered from north and west winds and faces south is preferable, in order to obtain all the sunlight. A coldframe is merely a glass-covered box, higher at the north end than at the south.

Preparations. If coldframes have been idle all winter or new ones made in February, take off about two inches of the old surface soil and spade the balance up well with a spading fork. Give it a good sprinkling of air slaked lime to sweeten it. If the days are mild, remove the sash, putting it on again at night; let it remain in this condition until ready for planting. Just before planting, spread a dressing three inches thick of well-decayed manure and a sprinkling of commercial fertilizer over the surface of the soil, and thoroughly work them in. With an iron-toothed rake smooth the surface until the soil is rather fine. Warm up the soil for a day or so by keeping the sash on tight and this will greatly assist the germination of the seeds. All this should be done early in March.

Sowing. A most important point for success is in properly sowing the seeds; put them in drills which are one-half an inch deep, cover, and firm the soil. After this is completed, the sash may remain on and a close atmosphere be maintained until the young seedlings appear, which will be in about ten days. Have the sides and ends of the frames banked with good stable litter or leaves to keep out the cold, and cover the sash with salt hay, mats or shutters at night, and at other times when the mercury goes below the freezing point, which is often the case; sometimes the mercury will go as low as 10° at this season. Remove the covering on all bright and mild days. A good indication of the proper time to cover the frames is when the glass begins to frost over.

Ventilating. Airing or ventilating should be watched, for the weather in March is very uncertain. Some days, the temperature outside will be as high as 55° in the shade, while other days will be dull and cold, with the temperature below the freezing point. As soon as the seedlings are up,



A simple device for ventilating hotbeds and coldframes. The notched support may be hinged in a slit in the wall of the bed, or may be so made as to fit down over it, so that it may be removed when the sash is closed

air the frame on all days when it can be done without submitting the plants to danger of frost and cold draughts, and close them about fifteen minutes before the sun is off them. While the seedlings are small, keep the temperature of the frames from 55° to 65°.

Watering. Water the plants in the frame between ten and two o'clock, so that they may have

a chance to dry off before the frames are closed for the night. Young seedlings need watering as soon as the surface of the soil looks dry; use a fine-rosed watering can and give a thorough soaking, taking care not to wash the seedlings out of the soil. Examine the condition of the soil by taking it in the hands and squeezing it; if it holds together the beds will not need water, but if, on the other hand, the soil falls apart, like ashes, then it needs a thorough watering, not merely a surface wetting. Always watch the top end of the frames, as that part always dries out more rapidly, because it has more sun and a better circulation of air.

Transplanting. When the seeds have made their first true leaves, transplant them into other frames, for if they are not separated, they will crowd one another. Set the plants about four inches apart each way, shade for a day or so or until they take hold of the new soil, then gradually inure them to the sunlight. Sprinkle the plants frequently to keep them from wilting. Stir the surface of the soil at least once a week, and remove all weeds as they appear.

Hardening off. Before transplanting the seedlings to the open ground, they must be "hardened off." This process needs one to two weeks. In doing this, air is admitted in larger and larger quantities until the sashes are removed entirely during the day. During the night ventilation is given by leaving the sash open, at first only a small crack, which is increased gradually until it is four

or five inches wide. The handiest thing with which to prop the sash open is a block of wood.

Lettuce, cauliflower, cabbage, onions and leeks can be subjected to airier conditions than peppers, eggplants and tomatoes. Lettuce, cauliflower and cabbage may be planted out about April 20. Onions and leeks are better not disturbed until they attain the size of a lead pencil. Peppers and eggplants require a frame having a slightly warmer temperature; they may be planted out about May 20. Syringe eggplants occasionally for red spiders. Tomatoes will make a stronger, sturdier growth if kept a little on the dry side.

LETTUCE —*Sow March 1, and for succession sow every two weeks. Varieties: Private Stock and Trianon Cos.*

Lettuces are divided into two classes, the cabbage, with the round head, and the Cos, with long, hard and narrow leaves. The cabbage variety is the most tender, and the Cos the best flavored. Sow the seed in finely raked soil and give them a very thin covering. After the young plants have made their true leaves, transplant to other frames, placing the plants nine inches apart each way. These may be grown on in the frames for the earliest crop, which will be ready for use about April 20.

The plants raised from the second sowing may be transplanted to 4 x 4 inches. Transplant to the open ground about April 15, placing the plants nine inches apart, in rows which are twelve to fifteen inches apart. When transplanting lettuce always select the strongest plants, discard all the

weaklings, and secure all the roots possible as well as all the soil that will adhere to them. When planting, keep the leaves well up from the soil, firm well the earth about the roots, water and shade for a day or so, or until they take hold of the new soil.

As long as the plants are in the frames, give them plenty of air. Stir the soil at least once a week to keep it mellow and to keep down the weeds. As soon as the ground can be worked outdoors, make the successional sowings there, rather than in the frames. If the weather should be dry, keep the ground constantly hoed and watered. In the extreme hot weather, grow lettuce in a partly shady place, as it runs to seed very quickly.

Good lettuce can be had in the late fall and early winter, if occasional sowings of seed are made in coldframes from August 15 to September 15. If the frames are protected from the extreme cold, good heads may be had up to Christmas. In order to insure good heads of lettuce, keep water from the heart; heading will be materially assisted by an application of nitrate of soda, which may be applied by strewing it over the surface of the soil, or it may be given in liquid form by dissolving a 3-inch potful in twenty gallons of water. When thoroughly dissolved this will supply about 162 square feet of soil. Two applications, at intervals of ten to fourteen days, will be sufficient.

TOMATOES — *Sow March 1, and for main crop April 15. Varieties: early, Dwarf Champion and Earliana; late, Stone and Table Queen.*

These two sowings will keep up a supply from June 20 until November.

Sow the seeds in drills six inches apart, cover lightly and water to settle the soil. When the plants are about three inches high, transplant to other frames, placing them from four to six inches apart each way. Set the plants so that the seed leaves will be just above the surface of the soil, and shade for a few days. Keep the soil a little on the dry side to encourage a short stocky growth. Until ready to harden the plants, keep a temperature of from 50° to 55°. Transplant to the open ground about May 15, in soil which is not rich, or they will make too much growth and few fruits. Set the plants four feet apart each way (Dwarf Champion needs only two and one-half feet), support the plants with a trellis or stakes and train about five stems, selecting the strongest shoots and removing all weak ones and laterals, or side shoots, tying them as they grow to protect them from wind, etc. In the fall, should there be danger of frost, tomatoes may be picked in the green, or half-ripe state and put on straw or boards, and be ripened in coldframes.

PEPPERS — *Sow March 15. Varieties: Bull Nose and Red Cayenne.*

A few plants of peppers will supply a good-sized family. They require a temperature of from 60° to 70°. Sow in drills which are three inches apart and water very sparingly until the young plants attain a height of three inches. Transplant to other frames, putting the plants three inches apart

each way, and transplant to the open ground about May 20. Peppers prefer a deep rich soil and are ready for use about July 15. They may be planted fifteen inches apart in rows which are two feet apart.

BEETS — *Sow March 1, and for succession every two weeks until August 15. Varieties: Bassano, Eclipse.*

Sow in drills which are one inch deep and ten inches apart. Maintain a temperature of from 50° to 55°, and when the plants are three inches high, thin them out to two or three inches apart. The surplus plants may be transplanted outdoors, setting them three inches apart, in rows which are twelve inches apart. The first beets in the cold-frame will be ready to eat about May. Beets delight in light, rich soil and require an abundance of water. The leaves may be used for greens.

CARROTS — *Sow March 1, and for succession every three weeks until July 15. Varieties: Parisian, Scarlet Horn, Half Long Danvers.*

Sow in coldframes in drills four inches apart. When three inches high, thin the plants to about one inch apart. Early Parisian is the best for cold-frames, as it is a small carrot and one which matures quickly. It is ready for use in about six weeks. Later sowings outdoors, of Early Scarlet Horn and Half Long Danvers, may be made as soon as the ground can be worked, in drills which are one inch deep and fifteen inches apart. Thin out as directed above, and keep the surface of the soil frequently stirred to keep it open.

EGGPLANT — *Sow March 15. Varieties: New York Improved, Black Beauty.*

Eggplant needs a hotbed. Have a rich, light seed soil and keep it rather dry, as the seed will not germinate if it is kept too wet. Maintain a temperature of about 80°. When about three inches high, transplant to another hotbed, setting the plants six inches apart each way. Syringe the plants frequently, especially the under sides of the leaves, to keep down the red spider, and avoid cold draughts. About June 1, transplant to open ground in very rich soil, setting the plants two feet apart in rows which are three feet apart. Water freely during dry weather, and dust lightly with an insecticide to destroy the potato bugs. The fruit will be ready for use about the middle of July.

ONIONS — *Sow March 10. Varieties: White Globe and Prizetaker.*

Onions require a very rich soil, liberal and frequent dressings of manure; fertilizers are also essential to insure maximum success. Sow in drills which are four inches apart, cover and firm the soil with a board in order that it shall retain the moisture. As soon as the young onions appear above the soil ventilate the frames, giving an abundance of air on all fair days. Frequently stir the surface of the soil and remove all weeds as they appear. As the onions increase in size, give them air at night, and if the weather is mild, the sash may be left off entirely. When about the size of a lead pencil (which will be about May 1) transplant to open ground. Put them in rows,

setting the plants three inches deep, five inches apart and sixteen inches from row to row. Onions may also be sown outdoors and thinned to three inches apart. The young onions can be used as they are, or the thinnings transplanted to other rows as has been described. Onions may also be grown from sets planted one inch deep, three inches apart and one foot from row to row. Sow the seed, or plant the sets, in March, as soon as the ground can be worked.

LEEKS — *Sow March 10. Varieties: American Flag and Large Carentan.*

Leeks are greatly prized for soups and when cut into small pieces and cooked as onions they make a delicious vegetable. Sow in coldframes and give the same care as recommended for onions. They will be ready for use in September. Transplant when the size of an ordinary lead pencil to trenches which have been dug eight inches deep and one foot wide, into which has been put a 3-inch layer of manure, and one and one-half inches of soil to plant in. Set them about two inches deep, so that the neck is covered, and draw a little soil up to them from time to time, as they grow, to blanch them. They may be grown in a double row, the individual rows being nine inches apart, and the plants six inches apart in the row.

BEANS — *Sow March 20, and for succession every two weeks. Varieties: Triumph of the Frames, and Early Mohawk.*

Beans require a light, not over-rich soil. For early use, sow Triumph of the Frames in cold-

frames, in drills two inches deep and one foot apart. Maintain a close atmosphere until the young plants show through the soil, then air and water carefully and on no account let cold draughts strike them. Beans require a night temperature of 60°, with a rise of ten degrees on bright days. They should be ready for use in six weeks from the date of sowing. Pick when young and tender. From about April 10 on, make the successional sowings in open ground, planting seeds of Early Mohawk in rows eighteen inches apart and two inches deep until August 15.

PARSLEY — *Sow March 1. Varieties: Moss-curled, Fern-leaved.*

Sow the seeds rather thickly in drills one-half inch deep, which are three inches apart. Parsley germinates very slowly. When two inches high, transplant to the open ground. For succession, sow April 1, and again on July 15, in drills one-half inch deep and one foot apart. The latter sowing can be kept over winter by covering with salt hay, or leaves, when cold weather sets in.

SPINACH — *Sow March 1, and for succession every two weeks until May 15. Varieties: Prickly, and Savoy Leaved or Bloomsdale.*

The early sowings of spinach in the frames should be in drills which are one-half inch deep and six inches apart. Keep the soil on the dry side until the seeds germinate, as they are liable to rot if kept too wet. A temperature of from 45° to 50° is sufficiently high. As soon as the seeds are up

nicely, give plenty of air; and a light dressing of nitrate of soda strewn over the surface will hasten growth. It should be ready for use in six weeks from planting. For succession, sow every two weeks until May 15. As soon as the ground can be worked, make the successional sowings outdoors in drills which are one inch deep and one foot apart. For summer use, sow New Zealand spinach June 1, in hills at least four feet apart, and one inch deep. For fall use, sow Bloomsdale again on August 1 and 15, and for late fall use, make a sowing in the coldframes on September 8. This last sowing will make good spinach for Christmas. Another sowing may be made about September 21; this can be wintered over and will be ready to gather the following March.

CELERY — *Sow April 1. Varieties: early, White Plume; second early, Fin de Siecle; mid-season, Giant Pascal; late, New Rose.*

Sow the seed in finely raked soil in drills which are four inches apart. Firm the soil well with a board by walking on it. Give an abundance of water, and as soon as the plants are two inches high, transplant in other frames, in soil that has been enriched with a layer of manure, three inches deep, which has been thoroughly dug into the soil. Set the plants four inches apart, alternate them in the rows and do not plant too deep; firm the earth well about the roots, water thoroughly to settle the soil, and shade for a day or two, until the plants have taken root in the new soil. They will now grow very fast and will need an abundance

of water at least once a day. The first sowings will be ready for the trenches, or cultivation on the level, about July 1.

Dig trenches fifteen inches wide and eight inches deep and four feet apart. Put about four inches of good cow manure in the bottom, treading it down firmly with the feet. Add about two inches of soil to plant in, so that the roots do not come in contact with the manure. When ready for planting, secure a good ball of earth with each plant and set them in double rows (which are about ten inches apart) and six inches apart in the row. Set firmly, taking care not to bury the heart. The best time to plant celery, unless the day be dull or there is a sign of rain, is in the afternoon from three o'clock, as the sun is then not so strong. From this on, the celery should be constantly watched, kept free from weeds and watered thoroughly and frequently if the weather is dry. For celery which is wanted for early use, earthing up is necessary about the middle of August. Pull the soil up to the plants with a hoe, breaking all lumps, gather the leaf-stalks tightly together with the left hand and press the soil closely around them with the right hand, using care to prevent the soil from falling into the heart of the plant, and thereby rotting it. Two earthings will suffice for White Plume and Fin de Siecle, then hemlock boards may be placed on edge on each side of the row and supported with stakes. This will help to blanch and whiten the celery. In this manner, White Plume will be ready for use September 15, Fin de Siecle

following in about four weeks. Giant Pascal is a large celery and one of the very best flavoured varieties grown. It will be ready for use about December 1. The late variety, New Rose, can be kept in trenches until May. Have the rows of Giant Pascal and New Rose from six to eight feet apart, so that there may be sufficient earth to protect them during the winter.

As fast as these two late varieties grow, bank them up, always doing it when the earth and the celery are dry, otherwise it is liable to cause the heart to rot. When the mercury indicates a temperature of 22°, it is time to put on the winter covering. This is done by placing boards as described for White Plume. The boards should reach to within three inches of the tops of the celery; then take two boards nailed together like a trough, with cleats projecting two inches over the sides, and place them on top of the celery. This forms a sort of box with a lid. Bank the earth up to the top of the boards, with a layer of leaves about a foot thick and a sufficient quantity of stable manure to keep the leaves from blowing away. Celery protected in this way keeps to perfection, and will have that rich nutty flavour so often desired and seldom had, and it may be dug any day during the winter.

Level cultivation is practised by a number of growers, but I have always found celery to do better when planted in trenches, as I believe the roots remain in a cooler condition.

CAULIFLOWER — *Sow March 1, and for suc-*

cession, every three weeks until April 15. Varieties: Early Snowball, Gilt Edge.

Sow in drills one-half inch deep and four inches apart. As soon as the plants have made their first set of true leaves, transplant to another bed, setting the plants about four inches apart. Water and shade and give all the air possible. About April 15, transplant to open ground in good rich soil. Set the plants about two feet apart each way, water freely at all times and stir the soil frequently. A little nitrate of soda or commercial fertilizer strewn around the plants will hasten their growth, and when they show signs of heading, break over the centre a few of the leaves to keep the flower white and to protect it from the sun. Cauliflower cannot be raised in the hottest weather. For fall use, sow the seeds of Snowball and large Algiers in the open ground on June 20 and July 11, transplanting as already described. The latter variety is the largest and best variety grown but is good only for late crop. Cauliflower takes from twelve to fifteen weeks to mature.

CABBAGE — *Sow March 1, and for succession June 1. Varieties: early, Wakefield; second early, Succession; late, Flat Dutch, Savoy, Autumn King.*

What has been said of the culture of cauliflower is equally true of cabbage. Both need the same treatment. Give good cultivation and for cabbage worm, dust the plants with an insecticide or with lime.

Cabbage can be kept through winter by digging a trench about six inches deep, setting the heads

in it roots up, and covering with soil and litter sufficient to keep out the frost.

PEAS — *Sow March 1, and for succession, every two weeks until June 1, beginning as soon as the ground can be worked. Varieties: extra early, Nott's Excelsior, Daniel O'Rourke, and Gradus; second early, Duke of York; medium and late, Champion of England and Telephone.*

Fresh, home-grown peas in the middle of May are a luxury, yet they may be had by sowing Nott's Excelsior in coldframes early in March. Sow in drills, which are one foot apart and two inches deep. They require a cool, moist situation. After the plants have attained a height of six inches, give a light dressing of commercial fertilizer strewn over the surface of the soil, so that it may be washed in when watering. It will materially help the plants. They will be ready for use in about ten weeks. Peas sown after June 1, may not do well; if the weather is too hot they are liable to mildew. To grow the best peas, give them a deep, rich loam. For outdoor culture, Nott's Excelsior and Daniel O'Rourke can be sown in drills which are three inches deep and two feet apart; the later varieties, Champion of England, Duke of York and Telephone must not be less than four feet apart. When the plants have attained a height of about six inches, pull about their stems about two inches of earth; the plants must be supported by chicken-wire or brush.

A few drills of radishes may be sown between the peas in the frames. They will be ready for

use in about four weeks; gather when crisp and tender. Early French Forcing and Ne Plus Ultra are good varieties for outdoor culture. Sow every two weeks until September 1. White Summer and Chartier are good varieties for summer sowing.

V

A YEAR'S CYCLE IN THE GARDEN

Being A Detailed Calendar Guide to the Work of Each Month by Which You Can Have A Really Efficient Garden Although Without Previous Experience

Note: — *These directions are arranged consecutively, both as to season and garden operations. The monthly divisions are indicated to simplify the plan, but it must be remembered that these are largely arbitrary. Certain work may be done in any one of several months, therefore, the reader must use his judgment and adapt his actions to his special conditions. But, in every possible case, let him take up each piece of work as soon as it is mentioned, and complete it without delay. There cannot be for the gardener too many reminders never to "put off till to-morrow, what can be done to-day."*

THE PLANNING SEASON: DECEMBER TO FEBRUARY.

WHO is thinking of gardening in January? What can be done when everything is frozen up tight? I have been gardening for a number of years, and have never let the month of January get by without having all my seeds procured and my garden

planned. I think a great deal of the trouble with our gardens lies in the fact that the amateur has not yet grasped the idea of practical gardening; for it is just as easy to run a garden properly as it is to neglect it. The yield of these so-called gardens is a very small percentage of what the ground should produce.

And yet these months are not solely for planning. After the first season, there will be hotbeds and coldframes to care for, vegetables in pits and trenches to watch and various other cultural operations to keep track of. I am going to presume, however, that we are starting a garden for the first time so that there will be no last season's crops to think of, and no experience to make use of. I shall let the year and these directions begin simultaneously.

JANUARY

The Garden Plan. The very first thing to do is to draw a good-sized map of your garden, accurately and to scale, showing just how much space you have, and where any obstructions, such as boulders, trees, permanent walks, etc., are located. Of course, we will hope that the ground is not shaded and is sufficiently drained; if it slopes a little, so much the better, especially if towards the south.

Your next step will depend on your available space, for the small fruits which should be a part of most gardens, would have to be left out in planning for less than a 50 x 50 foot space. In such a case, there need be no special paths laid out, for

it is far better to grow everything in rows running the length of the garden (north and south if possible). Long rows make necessary fewer turns when cultivating.

Some General Advice. If there is room for berry bushes, put them (1) all at one end of the garden or (2) all around it, in a three or four foot strip. Even apples, pears, etc., can be grown in this space, by using the dwarf trees, and training them on the walls, or fences bounding the garden.

Keep the rows of perennial vegetables (asparagus, horseradish and rhubarb) together, at the end of the garden, so that the rest can be plowed in one piece.

Plan to have the rows of root crops together, as they are all subject to the same diseases, and by moving all the rows from place to place each year, you can lessen the chances of such diseases becoming established.

Such quick growing plants as lettuce, radish and spinach, need not be given special rows as they can be put in between larger, slower growing kinds.

Make two plans, or else a compound one, the first part giving the first crops, and those that will remain all season, and the second, giving the succession crops i. e., those that fill in after a crop is removed, or are planted between permanent rows already sowed.

To find out just how many rows of each vegetable you will need, and how much seed you must use to plant the space, I have compiled the following table from standard authorities, and actual results in an average, well-cared-for garden. To use it, merely decide how many pecks, plants or heads

you will want, then compute the number of fifty-foot rows you will need.

SEEDS AND YIELDS FOR A DEFINITE AREA

VEGETABLE	SEED TO SOW 50 FT.	YIELD FROM 50 FT.	FINAL DISTANCE OF PLANTS IN ROWS	DISTANCE BETWEEN ROWS	AVERAGE LENGTH OF YIELDING SEASON
Beans, bush	½ pt.	3½ pks.	4-6″	24″	4 weeks
Beans, Lima	½ pt.	7 pks.	36″	42″	12 weeks
Beans, pole	⅛ pt. (15 hills)	10 pks.	36″	42″	14 weeks
Beets	1 oz.	10 bunches and 1 bu.	3-6″	15″	July 1,-all winter
Cabbage	1 oz.=3000 plants (25 plants)	25 heads	24″	24″	12 weeks early or all winter
Carrot	1 oz.	10 bunches and ¾ bu	2-4″	12″	July 8,-all winter
Corn	⅛ pt. (16 hills)	7 doz.	20-36″	30-36″	12 weeks
Cucumbers	⅛ oz. (10 hills)	5 doz.	48-60″	48-60″	4 weeks
Eggplant	1 oz.=1000 plants (20 plants)	80 "eggs"	24-30″	30″	12 weeks
Lettuce	¼ oz.	75 heads	6-12″	12″	10 weeks
Okra	1 oz.	500 pods	24″	30″	13 weeks
Peas	1 pt.	2 pks.	1″	24-30″	4 weeks
Peppers	1 oz.=1000 plants (32 plants)	40 doz.	15-18″	30″	16 weeks
Potatoes	25 tubers (50 hills)	1⅛ bu.	10-12″	24″	Till used
Radish	½ oz.		3-4″	12″	
Spinach	½ oz.	2½ pks.	3-6″	12″	4 weeks
Squash	1 oz. (16 hills)	175 squash	48-96″	48-96″	Sept.,-all winter
Tomatoes	1 oz.=1500 plants	7 bu.	18″	36-48″	20 weeks
Turnips	½ oz.	1½ bu.	4-6″	12″	Oct. 10,-all winter

Transplanted Vegetables. Some vegetables will have to be grown for a time indoors or in a hotbed and later transplanted to the rows you have alloted

them. These rows can sometimes be used for radish, lettuce and spinach in the meantime. The

VEGETABLE	SOW (WITH HEAT)		TRANSPLANT			
	WHEN	HOW	TO POTS	TO COLD-FRAME	TO OPEN GROUND	SPACE OUT-DOORS
Cabbage	Feb. 1–Mar. 1	Drills, 4″		Mar. 15–Mar. 30 4 x 4″	Apr. 15	2 x 3′
Cauliflower	Feb. 1–Mar. 1	Drills, 4″		Mar. 15–Mar. 30 4 x 4″	Apr. 15	2 x 2′
Celery	Feb. 1–Mar. 1	Drills		When 1″ high	July 1–30	6 x 10″ Rows 4′ apart
Eggplant	Mar. 15	Drills	When 3″ high	May 15 Keep in pots	June 1–10	2 x 3′
Lettuce (1)	Feb. 1	Broad-cast		When with true leaves 9 x 9″		
Lettuce (2)	Mar. 1	Broad-cast		When with true leaves 9 x 9″		
Lettuce (3)	Mar. 15	Broad-cast		When with true leaves 4 x 4″	April 15	9 x 12″
Pepper	Mar. 15	Drills	When 3″ high	May 15 (Keep in pots)	June 1–10	2 x 2′ or 2 x 3′
Tomato (1)	Mar. 1	Drills		When 3″ high 5 x 5″	May 15	2 x 4′
Tomato (2)	Apr. 15	Drills		When 3″ high 5 x 5″	June 15–30	4 x 4″

vegetables that will be handled in this way, together with the approximate dates for sowing and transplanting, are given on page 137. Lettuce and radish can be grown even to maturity under glass, giving fresh vegetables practically all winter. If you have room to spare, you can well afford to start some extra cabbage plants, to be sold later for twenty-five cents a dozen. Of some of these crops there will be later, outdoor sowings, but the culture will then be simpler, as directed under seasonal planting hints.

After you have planned the garden, do it again, even two or three times, that you may feel sure you have planned to *use the ground all the time with the least waste.* Don't be afraid to change the plan the second year, either, for the season's experience will give you a number of new and improved ideas.

Catalogues and Seedsmen. By this time, you probably have sent for seed catalogues and received them. Of course, there is plenty of fun to be obtained from studying half-a-dozen of these, comparing prices, claims, pictures and so on, but that is not the most economical way. You will do better, and save time, if you choose one reliable one, and make out your complete seed list from that. You will already know how much you need and perhaps will have heard of some particular variety that you want to try. However, if you are limited as to space and capital, better stick to one or two standard varieties, and experiment, if at all, very gently for the first year or so.

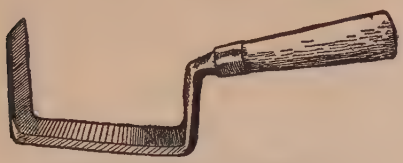
Good Seed. Do *not* make out your seed list and then go around looking for the man that can supply you the cheapest. Do not buy cheap seeds. We Americans buy seeds too cheaply; if seeds in England were offered at the same price that they are in America, they would not be considered worth planting in a garden worthy of the name. In England, their novelties in peas, for instance, sell for seventy-five to eighty cents per pint, while here they are retailed at twenty cents. I honestly believe you will get full value for your money, whichever you buy, by which I mean that their seeds are better than ours. Do not infer from this that American seeds are not good. They are just as good as the English seeds in germination, but we have not attained the perfection of *qualities in the varieties* that they have over there. It is good economy to buy the highest grade of seeds offered.

Kinds and Varieties. While we all have our favorite varieties of various species, one must always remember that others may think differently. If it were not so, the seedsmen would handle but one variety of each kind. I am not infallible, but speaking generally, the varieties here mentioned will, I think, be found satisfactory. Where there are early and late vegetables of one species, I give the best variety of both:

Asparagus	Palmetto, Early Argenteuil
Bean, bush	Black Valentine
Bean, bush, Lima	Burpee's
Bean, bush, wax	Currie's Rustproof
Bean, pole, Lima	Ford's Mammoth

Beet	Eclipse
Broccoli	Walcheren
Brussels sprouts	Long Island Improved
Borecole	Dwarf Green Scotch
Cabbage	Wakefield Early
Cabbage, red	Drumhead
Cabbage, Savoy	Drumhead Savoy
Carrot	Guerande
Cauliflower	Extra Early Erfurt
Celery	Chicago
Corn	Golden Bantam, Stowell's Evergreen
Cucumber	The Davis
Eggplant	New York Improved Purple
Endive	Broad-leaved Batavian
Leek	American Flag
Kohlrabi	White Vienna
Lettuce	Big Boston
Lettuce, Cos	Paris White
Muskmelon	Emerald Gem
Okra	White Velvet
Onion, yellow	Danvers
Onion, red	Wethersfield
Onion, white	Southport
Parsley	Extra Moss-curled
Parsnip	American Hollow Crown
Pepper	Cardinal
Peas	Alaska, Earliest of All
Peas, best quality	Gradus
Peas, biggest cropper	Telephone
Pumpkin	Large Cheese
Potato, early	Noroton Beauty
Potato, late	Carman No. 3
Rutabaga	Long Island Improved
Salsify	Mammoth Sandwich Island
Spinach	Long Standing
Spinach, summer	New Zealand
Squash	Vegetable Marrow
Tomato, early	Earliana
Tomato, main crop	Freedom
Turnip	Strap-leaved
Watermelon	Cole's Early

Just because the weather is cold, don't put off sending your order. Mail it at once and avoid all chances of having your seed delayed.



A hand weeder and scarifier

Keeping Seeds. It is not easy to destroy the vitality of seeds, but a little care will avoid trouble in the busy season. When you receive your seeds store them in a cool, frostproof place where they will be *perfectly dry*. If you are troubled with mice and do not think you can afford a proper mouse-proof seed chest, use an old bread tin.

Tools and Repairs. The chances are, that if you haven't gardened before, you will not be supplied with tools. Do not try to run your garden with a spade and a hoe; but on the other hand, you do not need a 2-horse cultivator for a small garden. The following tools I have found very useful: spade, digging fork, manure fork, asparagus knife, draw hoe, scuffle hoe, hose and sprinkler, 12-inch labels, garden line and reel, raffia for tying, shovel, trowel, watering pot and wheelbarrow. A roller is also very useful; if you do not wish to go to the expense of buying one, make it yourself.

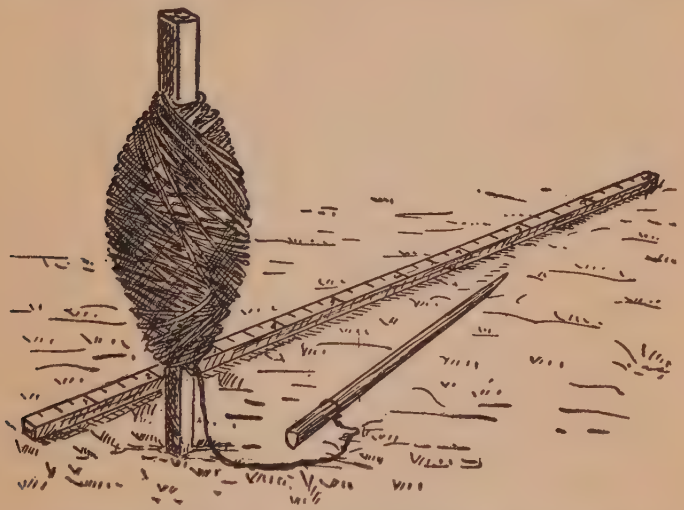
Trowels for special purposes. The broad, general purpose form is found in every garden. The rounded "Slim Jim" is useful in setting bulbs and deep rooted plants. The V-shaped type is one of the handiest all-round trowels yet devised

Make a cylinder of sheet iron, riveting it securely. Run an axle shaft through the centre and fill the cylinder with cement. After the cement hardens put on a handle and it is ready for use. A roller for seeds should weigh about 150 pounds per running foot. The size can be easily figured out, as cement weighs a trifle over 100 pounds per cubic foot.

Three useful forms of hoes for garden work

The roller is especially useful in dry seasons, when the soil needs more than ever to be brought into close contact with the seeds. At this stage however, the usefulness of the hoe becomes apparent. The surface of the ground should be kept loose and the scuffle-hoe or scarifier (illustrated on page 172) is the tool with which to keep it so. Some like the rake, but I revel in the action of the scuffle as it rips under the young weeds, cuts away their roots, and leaves them exposed to the sunlight. While under its influence the surface soil crumbles to a powdery mass. Other styles of hoe are equally useful for other kinds of work. The heart-shaped blade, shown at the left, can run a drill of any desired depth and width: the narrow-bladed form reaches in among the bushes and plants even where the scuffle will not: while for heavier weeding and hilling what can take the place of the old-fashioned, broad-headed article?

A measuring rod is also a useful garden tool. Get a 10-foot stick about one inch square, and paint one side white. Then measure accurately and at every twelve inches cut a notch quite deep and



The garden-line and the ten-foot measuring stick are often very useful and occasionally indispensable

all around the stick. Then mark the feet, plainly from one to ten, using black paint or indelible pencil. Cut a small notch in between each large notch for the one-half foot measure.

For large gardens, the wheel cultivator and seed drill are very useful, but small gardens can exist without them. A spray pump, however, is indispensable to a successful garden. If you haven't any, you can easily rig one up.

For anyone who wants to purchase some or all

of the tools, or who wants to know what he can save by improvising in some cases, the following table may be useful. It will be wise, however, to appreciate at once the fact that the hand tools, especially, must be of the best, to give the best and most economical results.

Roller	$ 8.00
Wheel hoe	8.50
Sprayer	3.75
Spade and 2 forks	3.00
2 Hoes	2.00
Rake	.75
Weeder	.35
Trowel	.50
Total	$26.85

All old tools should be looked over carefully at this time and repaired where necessary. Do not throw away a spade or fork because the handle is broken; buy a new handle and put it on. All tools should be in first-class shape and ready for the busy season. Clean out the tool house or place where the tools are kept, put up pegs to hang the tools on, dip all the metal parts in kerosene and rub with a rag and a little vaseline to prevent them from rusting. Keep the tool house in a neat, tidy condition — have it so that you can go in at night and be able to pick out what you want without a light.

Other Odd Jobs About the Garden. Now is a good time to cut pea brush and cart it home. That is, if you live where you can do so. If not, you will have to use wire, which is good, but not as satisfactory as the sticks. While some people call the

dwarf peas, which do not require brush, the "lazy man's pea," I am not sure that, in the very small garden, they would not be the best, for they need less space and less attention.

Perhaps you will have some warm days at this time, when you can clean up stones and rubbish and prepare for the real garden-making later on.

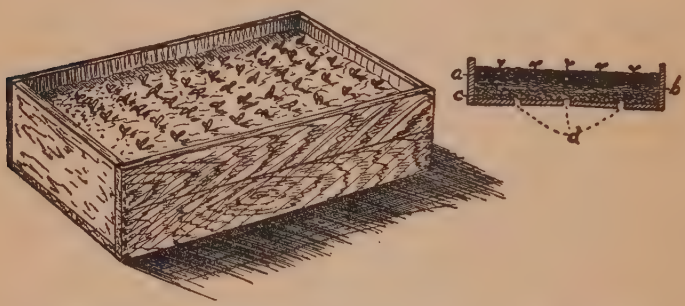
Manure. See if you cannot buy manure now, and haul it, unless you are saving it from animals of your own. In either case, arrange to keep it sheltered from rain and snow, and fork it over now and then. The more rotten and the finer it becomes the better, and thorough mixing will help break up whatever rubbish you can add to the compost pile. Dry leaves, lawn cuttings, vegetable waste from the kitchen, all such material will add to the value of the manure.

If you are buying it, be as liberal as you possibly can. Get rid of the idea that you can put too much good manure on your garden. You can make away with five tons on a plot 50 x 50 ft. and if there *is* any surplus, save it to make liquid manure during the growing season.

The First Planting. The very earliest vegetables, to which I have referred above, can be planted under glass, the end of this month, but they must be given warmth and protection. The ideal place is a green house, but a satisfactory substitute is a bay window, in which is placed a stand or table with its top at the level of the sill. Use "flats" or wooden boxes about 24 x 12 x 4 in. with a fairly loose bottom. First, spread about one inch of

Goshen College Library

coarse gravel or cinders for drainage; upon this a little coarse soil or broken sod, then fine screened soil to within half an inch of the top. Level and firm this surface, sowing the seeds rather thickly and covering but slightly with fine sand. Firm again and sprinkle. Change the boxes about on the stand frequently, and try to keep the temperature from going lower than 50 degrees F. at night; do not water too freely, but only when the soil seems nearly dry.



The "flat" is the indoor, early-spring, seed-bed. Any box about 24 x 12 in. and from three to six inches deep will do. Make several holes (d) in the bottom. Put a layer of stones or gravel (c); then some roots, moss or coarse sand (b); and on top an inch or so of finely sifted, light, sandy soil (a)

For the Fruit Garden. It is not too early to order the fruits that you are going to plant in the spring. You will stand a far better chance of getting good stock and your nurseryman will probably arrange to deliver it whenever you wish, say the middle of March.

Fruit in the Garden Plan. Decide just where you are going to put your fruit and locate each bush,

tree and plant on the plan. If you are going to have a series of rows, plan for the following distances at least:

Dwarf apples, pears, etc..	10 x 10 ft.
Grapes	6 x 8 ft.
Currants, gooseberries .	4 x 6 ft.
Raspberries, blackberries .	3 x 6 and 4 x 7 ft.
Strawberries	1 x 4 (rows) or 1½ x ½ ft. (beds)

Varieties. As to varieties and the number of plants needed, you must satisfy (1) your locality, (2) your personal taste, (3) available space. Certain varieties are suggested in these pages. Besides this, your State Experiment Station will tell you what kinds are hardy for your section and perhaps you will have a neighbor who grows fruit, or a friendly nurseryman, who will tell you the facts concerning the eating qualities of different varieties.

Special Requirements. If you want to try the dwarf trees, to save space, arrange to grow apples, pears, plums or cherries on the south side of walls or fences. Peaches and apricots will be more protected from an early start and subsequent frost injury, on the north side. These trees can be grown on wire trellisses if you desire.

Grapes will grow almost anywhere in the garden, and can be made doubly useful in covering unsightly objects, doorways, etc.

Currants, gooseberries and all the brambles, like a cool location; a northern slope is excellent, and shade is desirable, if not too dense and continuous.

The strawberries want a warmer, sunny location, but in small-scale gardening, can be grown between the rows of bush fruits or dwarfs. This interplanting will, however, need increased manuring, since we are doubling the call on the supply of plant food from a single area.

FEBRUARY

Hotbeds. February is the month of hotbeds — the time to build them and to find them most useful. I need not enlarge on the reasons for having a hotbed; they are clearly illustrated in the early maturity, size and perfection of vegetables started under glass. Under our new scheme of intensifying results, the hotbed assumes an even greater importance than formerly, so you must certainly plan for one or more. Complete hotbed directions are included in Chapter IV.

The Growing Plants. During this month, keep the seedling cabbages, cauliflowers and lettuce (if you planted any in January) moist and protected from cold. As soon as they become at all crowded, you will have a chance to use your hotbed. If it is not ready, you will have to make more flats, for the seedlings, when about an inch high, must be transplanted. Set them two or three inches apart each way, making a hole in the fine, levelled soil with a small stick or pencil and pinching the earth firmly about the plant. This transplanting will probably take care of the plants till they can be set in the ground. If the season is late, it may be necessary to shift the cabbage once more into the beds as is described above in the

scheme for managing hotbeds. Some lettuce may be matured there if you can spare room for the heads, to be thinned to nine inches apart each way.

New Plantings. Other vegetables that you should sow this month, in the same general way as I have directed for the cabbage, are onions (and leeks), celery, about the middle of the month, and more cabbage, cauliflower, and Brussels sprouts, if you like them, about the end of February. This will be your main "early crop," the January planting being merely a small, extra-early attempt to gain time and, often, to take advantage of the call for early cabbage plants.

The brambles make a lot of unnecessary growth in a season. Prune them during the resting or dormant winter period: any time from November to March, *but no later*

If conditions are really favorable for keeping them warm, sow tomatoes, eggplant and peppers, just about the end of the month. For all of these

you will need but a little seed, as you can see by the January table. However, always sow at least twice as much seed as you wish plants, to allow for the failure of some of the seeds to germinate, and to give you a chance to select the best seedlings for transplanting.

The bramble bush after being pruned. Leave only a few strong canes, and head these back to a length of two or three feet

Fruitward Thoughts. If you have any bright days when you can dig in the garden, begin to fit the ground for your fruits. Dig it thoroughly; three feet deep is not too much; take out the soil and put back a mixture of soil, manure and, if the land is heavy, sand or coal ashes. The bush fruits and strawberries, especially, like a fairly light, well drained soil, while for peaches, it is essential.

THE SEASON OF PLANTING: MARCH TO JUNE

Correct and careful planting is a vital necessity in a successful garden. If you have kept ahead of

the preliminary work up to now, you will be better off than many a gardener, but you must, if anything, increase your care and promptness from this time on.

Don't let over-cautious conservatives worry you by suggesting that it is "too early to plant this or that." If you follow these directions you *may*, it is true, lose some plants, perhaps a small crop, by frost. But then, a few cents' worth of seed is not so much to lose at this time, whereas there is a good chance that the plants will stand, and you will be the gainer by days, or even weeks. Most certainly take some such risks. The game is very worth the candle.

MARCH

Planting and Transplanting. March is a very busy month for the progressive gardener. Seed sown now sprouts, but, because of cool nights, the top growth is slow. The roots, however, are foraging and as soon as climatic conditions are right, you have a big-rooted plant ready to push right ahead.

I am supposing that you have already started some of the hardier plants in the hotbed, and perhaps a few tomatoes, eggplant and peppers, indoors. If you haven't done this start the cabbages, etc., *at once*. The tender seedlings must be kept indoors until the middle of the month, but at that time you can start some more in the hotbed.

If the temperature goes too low for these soft, sappy plants they soon turn yellow and it takes a long time to get them back to normal condition.

But in a properly prepared hotbed, it is safe to sow them any time after March 15. A good plan is to partition off the section used so that it can be kept slightly warmer than the balance of the frame; and if you have space to spare in the cool part of the frame, sow some beets, carrots and parsley. These should be sown broadcast and rather thinly, as they need not be dibbled off, but can be transplanted directly to the garden when the proper time arrives.

Moving Last Month's Seedlings. Seed planted last month should by this time have developed young plants quite well advanced, and they will soon be ruined for want of light and air. We must now prepare some sash for receiving the young plants. Put the hot manure in the frame the same as you did for the seeds; put the soil on top, but this time it should be rich. When it has become well warmed, the frame is ready to receive the plants. Take a 4-inch board the length of your frame, place it against the end of the prepared ground and mark along the inside with a sharpened stick. Turn the board over and mark again, and so on until finished. You will not need to mark the opposite way if you use a little care in setting the plants. If you get the first row right — the plants four inches apart — the others will follow right along; but always "break" the rows — that is, plant opposite the spaces, aligning the plants of alternate rows.

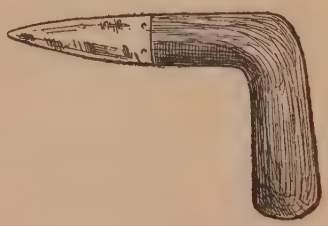
Just How to Transplant. In setting out the plants or dibbling off, a little care must be used. To begin

with, the plants must not get frosted; so select a nice sunny day, take a seed pan or board and lift a clump of the young seedlings, covering them well if the weather is cold and with a newspaper if the sun is shining. Do not take out any more than

When transplanting seedlings cut back any that have developed more than two leaves. The cross lines indicate the relative amount of leaf surface to be removed

fifty at one time. When these are planted, return to the seed bed for more. Use a little judgment in regard to the condition of the soil both in the seed bed and frame. The soil should be moderately moist, and in the newly prepared bed, it should be about the same as in the seed bed. The advantage in this is that the roots will bind more quickly.

"*Dibbling.*" Take a sharpened stick about three or four times the thickness of a lead pencil, stick it in the ground and turn it around, bearing on the outside of the hole. With the left hand, hold the young plant by the top of the few leaves, drop the roots of the seedling into the newly made hole and firm. This is done by pressing down with the end of the stick, holding it almost horizontal instead of perpendicular. The depression made in the ground is left, as that forms an excellent medium for watering the young seedlings. Be careful to plant the seedlings at the proper depth — a mere trifle deeper if they have had plenty of air and light in the seed bed. If they have been allowed to stay in the seed bed too long, or if the seed was sown too thickly, the seedlings are very apt to "draw up" or get spindly, and they will have to be set deeper accordingly. This applies more particularly to the cabbage family.

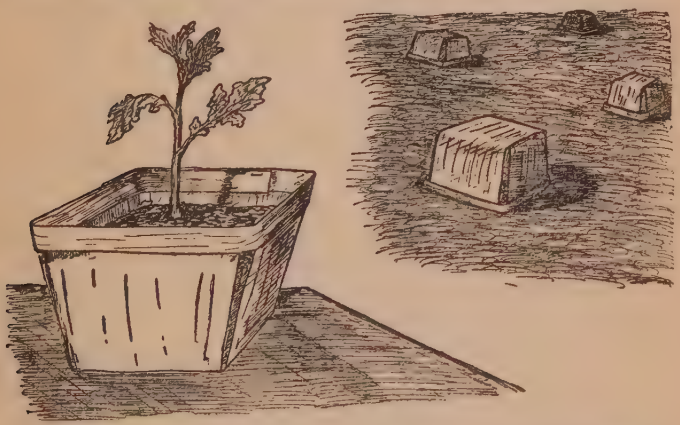


The dibble — a great time saver in transplanting. Anybody can make one

When to "Dibble." The proper time to start dibbling the young plants is when the third leaf is almost developed; but if it is neglected until

after the plants have passed this stage, a good plan is to pinch them back slightly after planting. By removing about one-half of each leaf from cabbage, cauliflower, celery, etc., the plants, having less to sustain, are not so liable to flag and will quickly start root action. Sprinkle the plants well after planting, but do not flood them. If the young plants are moistened every fine day *in the morning*, from a sprinkling can with a *very fine rose*, they will pick up quickly.

Paper Pots. Another good scheme for small gardens (but impracticable for large places because of the time consumed) is to plant the seed-



Old berry boxes are useful in at least two ways, i.e., in place of pots for raising seedlings, and for protecting newly set plants from sun, wind, and frost

lings in paper flower pots. I do not mean the heavy paper kind, but the cheap ones made of pasteboard. They can be set very close together

and when planting-out time comes, it saves the plants from a second check. You need not wait for a dark rainy day, either, to do your planting, as the roots, being confined, form a ball and none are lost even though the pots have been torn or destroyed. I do not recommend pots for celery plants, but for cabbage and cauliflower they are excellent. I always advise the use of pots for egg-plants and peppers. Save your old berry boxes for this, too. They can be used, after the plants are set, for covering them on cold nights, and bright, hot days.

The First Potatoes. We are not confined to the hotbed for the month of March. There are numerous things outside that can now be done. Plant some early potatoes about the end of the month. This is not a joke; the sooner you realize that all potatoes are better when planted early, the better it will be for you. I always try to have them all in by the middle of April, for by planting early the plants get well established before the dry weather of summer comes on.

In any event, do not permit March to pass without getting in a few rows for use about the latter part of June, (in the neighborhood of New York). In planting early potatoes always use manure in preference to other fertilizers, as it keeps the ground slightly warm until the eyes throw out shoots. In case of a late frost after the shoots show above ground, go along the row with a hoe and draw a little soil over them. In cutting seed potatoes always cut to one eye and remove entirely the butt

end with all the eyes on it. After cutting the potatoes dip them in sifted ashes and spread them out on the cellar floor for a day or two to dry well before planting.

Making an Asparagus Bed. This is also a good time to think about setting out an asparagus bed. Do not get the largest roots as they are very slow in starting. The two-year old roots will be found preferable to the larger sizes. To grow really good asparagus you simply must make a perfect bed: trench the ground three feet deep — four is even better — and add an abundance of well-rotted manure. Put four layers of manure in each trench. A year ago I put into a bed 180 feet long and 100 feet wide about 100 loads of manure.

Dig a trench about six inches deep and about twelve inches wide, go along the trench and place the young plants, crown up, about eighteen inches apart, taking care to spread the roots nicely. Run the rows north and south, if convenient. Throw a couple of inches of soil over the roots and firm nicely with the feet, but don't tramp on the crown. About the middle of summer pull another couple of inches of soil into the trench and in the fall, level off the surface.

Advice for the Future. When your bed is about two months old, it should be given a liberal dressing of salt, which not only kills weeds but serves as a valuable fertilizer and conserver of moisture. In future Marches, the old bed should be spaded over and manure turned in. Each year the crowns work nearer the surface, so that after several years,

it will be necessary to hoe the soil up over them when digging manure into the bed. Do not be afraid of breaking a few roots in the process, as new ones will quickly shoot out.

Rhubarb Beds, too. This, being an extra early vegetable, must be attended to now. Rhubarb is started from cuttings of the crown, and if you can find an old bed, chop a few of the roots into quarters and set them in your own garden, using plenty of manure well dug in. Rhubarb plants should be placed about two feet apart. Each year the oldest, seediest plants in the bed can be divided in this way and given new strength.

In the left hand sketch the soil was not prepared deep enough, and the manure, left near the surface caused crooked and branched root growth. Deep soil and thorough mixing of soil and manure are essentials in growing parsnips, carrots, etc.

Getting the Ground Ready. You can spread manure this month, if the snow has disappeared and perhaps the ground will be thawed enough for breaking up. On a quarter of an acre or more, it will pay to hire someone to plow and harrow for you. But in most backyard gardens, hand work will be the most economical, and a little digging every day will prove a fine "spring medicine" and appetizer. Spread the manure thickly and dig the soil deeply with a spade. This means at least a foot or better still, two, and the soil must be broken up thoroughly and the manure completely mixed with it.

Clay Soils. If your soil is clayey, and seems sticky you will have to let it dry out more, as this kind of soil can be spoiled for the whole season by being worked when wet. When you can dig it up, add some fine coal ashes, or sand, as well as plenty of manure, and you will be saved a lot of trouble next year. If the ground is low generally, an application of air-slaked lime will be very beneficial, and it is not too late to do it now. Use it plentifully and you will avoid many battles with cutworms and maggots.

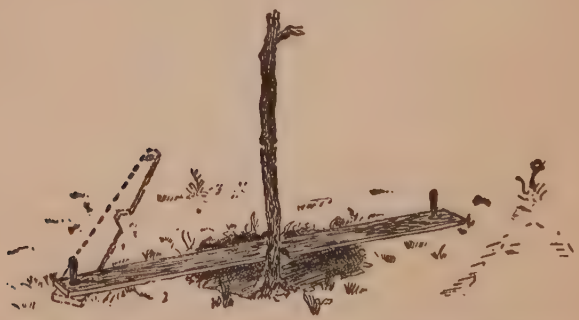
The Seed Bed. After plowing or digging, as the case may be, comes repeated harrowing (also to be hired done), or several rakings. These leave the surface level, the soil compact and finely broken up, and the bed free from stones, sticks and unrotted bits of manure. The latter can be thrown on next year's compost-manure pile to advantage. When your soil is in a fine, loose condition, a light

rolling makes it still better for seeding, but afterwards you must go over it with a rake very lightly, to produce a "dust mulch," and prevent evaporation.

You can, perhaps, sow some seeds of lettuce, peas, onions, radish and spinach outside by now, but use your judgment as to the weather and conditions of the soil. However, as April is the real planting month, look there for exact directions for sowing seeds.

Planting the Fruit Garden. *Now* you can plant all your fruit, and get it over. That is, as soon as the soil stops freezing every night, so you can keep it stirred. If your trees and bushes arrive before you want to put them in the ground, don't unpack anything; leave the bundles or boxes in a cool, moist place. They will keep for several days this way, and you avoid the breaking of roots and twigs attendant on much handling.

Tree Fruits. Dig the holes bigger than the roots



The planting-board is simplicity itself to make, and permits you to set trees in perfect alignment

seem to need so they can be spread out comfortably. Cut off clean, any broken or ragged roots. The pruning of the head is more difficult and depends on the kind of tree you want. If simply a dwarf of standard shape, cut back the branches to three or four and shorten these to several inches. For trained trees to grow on walls or a trellis, cut back all but the number of branches you want, and trim these to a whip or single stem. These are to be tied to the support in the form you decide on — fan-shaped, U-shaped or single, diagonal cordon, etc. Sift the soil about the fine roots and firm it down, emphasizing this firming process till the hole is filled, when a layer of loose soil may be left on top to prevent evaporation.

Grapes. Prune the roots, as directed above, and cut back the top close to the ground-level if this has not been done in the nursery.

Bush Fruits. Take similar care of the roots but leave two or three strong stems two feet long or so. These will be the bearers the second year.

Strawberries. There is no pruning save the trimming of the roots necessary in planting strawberries. More care should be taken to keep them moist, however, and to avoid planting them so deeply as to cover the crowns.

In planting all the other fruits it is well to set them a trifle, perhaps an inch, lower than they were in the nursery row.

As I have said, do not follow these directions literally, in the face of common sense. If it is obviously too wintry, even at the end of March,

wait a little longer before you plant, especially the strawberries.

APRIL

The Value of Manure. It must be remembered that the garden cannot be planted in a few minutes; gardening requires patience, a strict adherence to small details, and also considerable foresight. Try to have your garden a little better than your neighbor's. Feed your ground; there is no use trying to grow crops on poor, impoverished soil on which chickweed could hardly exist. Some soils respond readily to fertilizers, but in most cases well rotted farmyard manure proves the best tonic. Don't feed in spoonful doses, but give liberal applications.

One of the chief values in manure lies in its capacity to catch and store moisture; lack of manure, and therefore lack of moisture, causes more poor vegetables than anything else. Vegetables are quick growers, of a succulent nature, and are curiously affected by a lack of moisture. With carrots, for instance, the core gets very hard and dry and the outer part peels off. In beets it will be shown by white, hard lines; in peas by small size; in beans by the pod being curved and very stringy. In celery the stringiness is, in nine cases out of ten, the result of insufficient manure, which will also cause peppers to become very strong and cabbages to form stubby roots.

Repeated Advice. If you have new ground to break for a garden, have it well plowed, using a

subsoil plow to break the bottom. Digging is better if you can afford it, in which case trench it about three feet deep, throwing the top soil to the bottom and adding plenty of manure.

After the ground is dug the section which is to be used for early vegetables (that is, the highest or best drained ground) can be raked over with a wooden rake to smooth it off. Then run a roller over it before sowing the seeds.

The Principles of Seed Sowing. The idea to be remembered in sowing seeds is that they should not be planted too deep nor too shallow; too thin, nor too thick. The depth of the drill varies according to the vegetable to be planted. Allow about one-quarter of an inch for lettuce and seeds of that size; about one-half inch for parsnips and such seeds; about one inch for beans; and about two inches for peas, except the first sowing, which should be about four inches deep. Sow enough seed to have a good full row and reduce the thinning out to a minimum; but do not throw the seeds in by the handful.

Drilling. In making drills, measure with a line and have it straight and taut. For peas use a spade, which will give a drill one foot wide. For beans in double rows use a hoe, making the drill the full width of the hoe. For seeds that require single drills not less than one-half inch deep, use the hoe edgewise; for

The simplest, cheapest and probably commonest form of garden label

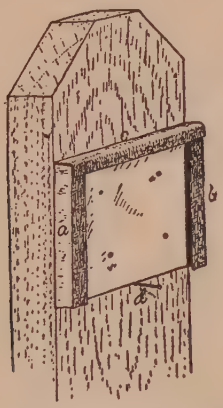
small seeds, where a really shallow drill is required, use a sharpened stick or a plant label. Always use labels of some description to tell where each vegetable is planted. Twelve-inch garden labels cost but a cent apiece, but if you feel you cannot afford to buy them, use strips of shingles. Always mark the variety and date of sowing on the label. If you mark the same thing on your garden plan it will certainly help you next year when planning your garden.

As soon as you have decided on the plans of your garden, spend another evening or two writing the labels. Include the number of the row according to the plan, and the approximate date of sowing, as well as the kind and variety of vegetable. If you do this you will bless yourself about April, when otherwise you would be scurrying around looking for bits of stick to mark the rows, or the pencil that had fallen out of your pocket, or trying to make the packet that the seeds came in stay in its place in spite of the wind that continually blew it away. Label the berry bushes, the grape vines and the fruit trees individually, especially if you have several varieties.

The sliding cover protects the writing and makes the simple form of label suitable for the perennial vegetable beds, and the berry rows

The All-Season Crops. Starting from one side

of the garden, mark off one row for parsnips, one for salisfy, then Swiss chard, parsley, celeriac, scorzonera and chickory, and dandelion if you wish. Sow more



In this permanent form of label, the plate of glass covers and protects the writing and is held in place by the folded edges of the metal case a, b, c. The nail d, permits the glass and card to be removed instantly

than one row if you think you will need it. Then sow onions and leeks. All these vegetables should be put together, for only one sowing is made and they remain in the ground the entire season. If you grow late potatoes it would be wise to plant them next to the vegetables just mentioned, as they are all in the same class.

If you have room for the first sowing of early

vegetables alongside the all-season crops they may be planted there; but if not, prepare another strip. Sow early peas, spinach, radish, lettuce, etc.

Covering the Seeds. In filling the seed drills a wooden rake is most generally used. If you are in the habit of using a rake to cover seeds, be careful not to dig into the ground, but gently pull the soil back into the drill. A better plan is to do this work with the feet. Place the feet on the drill, heels together, and each foot at an angle of 45°. Walk along, first pushing one foot forward and then the other, being careful not to raise the feet from the ground. This shoves the soil back into the trench and firms it at the same time.

Root crops are sometimes attacked by maggots; onions are invariably, and radishes are also easy victims. The best preventive is soot, which can be procured from any seedsman. Sow this right on top of the drill where the seed is planted, using a five-inch potful for every fifty feet of drill. If you used lime when you dug up the soil you are less likely to be troubled by these pests.

Sowing for Succession. After you have sown parsnips, onions, etc., you are through sowing this class of vegetables for the season, but peas, radishes, lettuce, carrots, etc., require occasional sowings to keep up a fresh supply. They should be sown from time to time as follows:

Bush Beans. Every two weeks from April 30 to August 15.

Beets. Every three weeks from April 1 to August 15.

Carrots. Every three weeks from April 1 to August 15.

Chervil. If used for flavoring or garnishing salads, etc., should be sown every three weeks from April 1 to August 15.

Corn. Every two weeks from May 1 to July 30.

Cucumbers. Every three weeks from May 1 to July 30.

Lettuce. Every two weeks from April 1 to May 15; then every week until September 1; then every two weeks until October 1. The idea of this is to sow in small batches during the hot weather, as it soon runs to seed at that season.

Onions. If you are fond of green onions, you can have them by sowing every three weeks from April 1 to September 16.

Peas. Every week from April 1 to June 1; then again, on July 15, being sown every two weeks until September 1.

Radish. Every week from April 1 to October 1.

Spinach. Every week from April 1 to May 30. Then stop until August; then sow every week until September 1.

Turnip. Every three weeks from April 1 to May 15. Then again from July 30 to September 1.

The following varieties of vegetables have been recommended for April sowing:

Asparagus, Palmetto, D'Argenteuil; *Beans*, Green Podded, Black Valentine; *Beet*, Early Eclipse; *Brussels sprouts*, Brechin Castle; *Cabbage*, Early Jersey Wakefield; *Carrot*, Guerande; *Cauliflower*, Earliest Dwarf Erfurt; *Celery*, Chicago; *Celeriac* Erfurt; *Chervil*, Curled; *Kohlrabi*, White Vienna; *Leek*, American Flag; *Lettuce*, May King; *Onion*: for large onions, Prize-

taker and Alsa Craig; for best keepers, Red Wethersfield, Yellow Globe Danvers and Southport White Globe; *Parsley*, Moss Curled; *Parsnip*, American Hollow Crown; *Peas*, Alaska, earliest of all peas, but very poor quality; New York Market is a good early pea, but sow Gradus at the same time. Make three sowings in the month, using one or two rows of New York, Marshall or Nott's Excelsior, and the balance all Gradus, a pea you will never tire of. *Potatoes*, For early use, Bovee, very free bearer, or Noroton Beauty; for main crop use Carman No. 3, Green Mountain, or Uncle Sam. *Radish*, Ne Plus Ultra or French Breakfast. *Salsify*, Mammoth Sandwich Island. *Spinach*, Viroflay and Victoria. and, towards the end of the month, sow a row of New Zealand for summer use.

If you have absolutely no room for coldframes or hotbeds and have no early-sown cabbage plants, you can make a sowing of this vegetable about April 1, and at the same time one of cauliflower and Brussels sprout seeds.

Celery can now be sown outdoors for the late or main crop and will follow up the early lot which was started in February.

Get your potatoes in now. You do not gain anything by putting off such jobs. As suggested last month, cut your seed to one eye and plant about twelve to fourteen inches apart in the row.

Corn. If I were you, I'd try a few hills of some early corn, say Golden Bantam. Maybe there will be no more frost, and you can be having sweet corn while your neighbor is dreaming about it. Now is the time to prepare melon hills. Use a liberal amount of manure, and if you can procure some fresh sod, it is a good plan to mix it with the manure, using two-thirds sod and one-third manure. Dig holes two feet deep and three feet across and fill them with the compost, raising the hills a few inches

higher than the ground level. Then place the frames to give the ground a good chance to get thoroughly warmed. If you haven't any frames, do not try to grow melons in Long Island, or places of similar latitude, because melons, without the help of sash frames, do not ripen until the middle of September. As the nights then get very cool the melons lose their flavor, crack considerably and are at the mercy of the melon blight. Build a few frames; they will not cost very much. All you require is a one-foot-square box nine inches high in front and twelve inches in back, and a four-glass sash to cover it. Old fruit baskets with the bottoms carefully removed and a plate of glass substituted will do at a pinch. Get the hills prepared early in the month and the frames placed, and sow the seed any time after the twenty-fifth.

You can also prepare Lima bean hills now, but I would not advise sowing until after May 1. Dig good deep hills for the Limas and add plenty of manure to the soil. Mark off the row and place poles by making good deep holes with a crowbar, then dig around the pole and fill in with the soil that has been removed, to which about one-third manure has been added. I use a wheelbarrowful to every three hills.

Before setting plants of cabbage, cauliflower, Brussels sprouts, leek, lettuce, etc., out in the open ground, harden them off slightly. Start by having a little air on the frame at night and keep gradually increasing the amount until by the end of the month the sash can be left off altogether.

Eggplant, peppers and tomatoes are best left in the frames until the end of May and should not be subjected to the hardening-off process. So partition off your warm plants in some way.

When sowing seeds by hand, the row-marker is a great help in making the garden convenient, orderly and attractive. Get the first row straight with a garden line

Make drills about three or four inches deep for cabbage, cauliflower, Brussels sprouts and leeks with the edge of a hoe. The drill protects the newly set plants from the wind and sun, and catches water; the soil can easily be levelled off after the plants have attained any size. It is not practical to do this with lettuce or onions. When planting out vegetables always place your line and make a drill as a guide to getting straight rows, but for lettuce and onions and such vegetables, make it very shallow, one inch being deep enough.

THE BUSY GROWING SEASON: MAY TO OCTOBER

MAY

You will be planting, throughout this month and the next, but the care of the growing crops will

commence, also, and I want to emphasize its importance right away.

Don't wait for weeds to appear before you begin to cultivate. See if you cannot prevent the appearance of even one. I assure you the task will become easier and easier as the weeks go on. Whenever you thin out a row clean out the weeds — if there are any. But better than this scratch the soil *very lightly* every few days — whether there is anything sowed, or growing, or not. The majority of weeds in a garden are from home-grown seeds, so if you exterminate the first crop before it ripens, you will have seriously inconvenienced any future weed growth. And don't forget that frequent cultivation is the next best thing to rainfall for keeping plants supplied with moisture; the latter cannot evaporate from the firm soil beneath; the plant-roots get it. Before you begin to cultivate sit down and learn one rule by heart. *Don't cultivate, hoe, or pick beans when they are wet.* Anthracnose, the cancer of bean diseases, will certainly become an epidemic if you do.

Good for hand-weeding and loosening the soil, among perennials.

It may seem as though I had lost sight of the fact that this is the garden of a business man who cannot give all day to his vegetables. But I have not. It is remarkable how much you can do in an hour, in a garden built on the modern, long-row plan, and with the up-to-date implements. Suppose you can walk fifty feet in, say, ten seconds. Then surely

you can push a wheel hoe that far in a minute and with five seconds for turning at the ends, you could cultivate nearly sixty rows in an hour! By doing a little each day you can cover the whole

The scuffle-hoe or scarifier is excellent for working close to rows and under bushy plants. It supplements the wheel-hoe

garden twice a week and still leave time for transplanting, watering (which you can leave to the sprinkler) and the other tasks. Just keep busy while you are at it, and you will be surprised at the results.

The Main Corn Crop. Keep right on sowing seeds this month. One of the main crops for May sowing is sweet corn. No vegetable is more affected by poor ground. You have noticed poor, scrawny-looking ears not filled to the ends, and again others that were all right in appearance, but lacking in quality. The cause in each case is lack of proper nourishment for the plant, and by that I mean manure. Most folks use fertilizers instead, which is all wrong for sweet corn. With field corn you use the dried ear and you don't care whether it is milky or not, but the case is reversed with sweet corn. It must grow quickly and manure is necessary especially during dry summers. Give the ground a coating about 4 to 6 inches thick and plough or dig it under, not necessarily deep, as corn is a rather

shallow rooter. I prefer to plant corn in rows because all kinds do not grow the same size, and so do not require the same spacing. This is easily regulated by thinning when the corn is planted in rows.

Plant Golden Bantam for a first crop; it is not only a very early corn, but one of the best flavored. And don't forget Stowell's Evergreen and Country Gentleman, which are the best of the late corns.

Melons and Lima Beans. If melons have not been sown as suggested last month, see to it at once and always put plenty of seed in each hill, as it is very poor economy to be saving of seed. Put at least 12 seeds in each hill, as the plants are easily thinned out at the proper time, when only 3 plants should be left in hills if 8 feet apart; but if they are 10 or 12 feet apart, 4 plants may be left.

Sow Lima beans if the weather seems settled and there is a little warmth in the ground; you don't gain anything by planting Limas before. A few cool nights after the plants are above ground will cause them to turn yellow and the result is a season of very slow, stunted growth. May 10 is quite early enough for New York and similar localities.

If rain occurs within 48 hours of the time of sowing, the seed will rot and the work must be done over. In heavy soils, 96 hours is not too long a limit to place. Examine your seeds after a rainfall and see if they are rotting or not. Making a circle around the pole about two inches deep, filling this with sand, and sowing the seeds in the sand may save you from sowing the seeds a second time, as the sand dries very quickly after a rain.

Bush Limas are best sown in rows, but as the seed is smaller and considerably harder than that of the pole kinds it is not often necessary to plant them in sand. If you were troubled with poor germination, however, try it.

Pumpkins, Squash, etc. About May 1 you can prepare hills for cucumbers, squash, pumpkins and watermelons. Make them moderately rich. Dig holes about 3 feet wide and about 2 feet deep and add about one-half wheelbarrow load of manure to each hill, and in measuring the manure don't take the wheelbarrow that your boy plays with around the garden. I mean a regular sized garden barrow.

All these vegetables are heat-lovers and will surely feel the effects of a late nor'wester, so about the tenth of the month will be time enough for sowing. Watermelons can be sown earlier if you have frames for them. Allow 10 feet between the hills if you can. If you are short of space, sow pumpkins, squash and watermelons in the early corn patch, and when the corn crop is finished the stalks can be cut down to give the other vegetables a chance.

New Zealand Spinach is a continuous grower from the sprouting of the seed until cut down by frost, and is a welcome summer green. Some folks dislike this vegetable simply because they never give it a fair opportunity. It is of succulent nature and demands plenty of manure. It must thrive to be sweet and tender; remember to cut it often, even if you cannot use it all yourself.

Sow okra any time after the 10th of the month in

single rows, thinning the plants to about 12 inches apart.

Succession Sowing. Sowing for succession must never be lost sight of, because if a sowing is neglected, the chain is broken and the continuity of crops is lost. This becomes more important as the season advances, as the time of maturity of the crops is also lessening. To illustrate: peas sown April 1 and 15 will have an interval between maturity twice as long as the time elapsing between two sowings made on the 1st and 15th of May. At the end of the year the process works in the opposite way.

Make four sowings of peas in May about one week apart. The three best varieties for May sowing are Gradus, perhaps the best of all peas when you consider quality; Telephone, also a good pea, and an excellent cropper; Champion of England. I plant these two last alternately with Gradus; they give heavier crops.

Sow spinach and radish every week during May, for at this season spinach runs quickly to seed and radishes get very strong. Both these vegetables can be used as "fillers" in any other rows. Radishes can be sown in melon hills or with carrot and parsnip seed. They will mature and be removed just about when you thin the main crops.

Spinach does well between the squash and melon hills before the vines spread. If the former is well watered, it will not run to seed so quickly. Make two sowings of carrots and beets during the month, and also sow turnips twice.

Lettuce must be sown often during May, as the crop will mature during the warm weather and no matter how much care we use a certain percentage is sure to run to seed; this can only be reduced to a minimum by frequent sowings, say about one week apart.

I sow string beans about every three weeks for succession. I usually sow in single rows, but I don't see any great objection to the double row — neither can I see any advantage.

Plant corn about every two weeks. A good plan is to sow your early variety first, say about May 7, then on the 14th sow one row of early, and one row of a late variety; about the 28th sow two rows of late. This method will certainly insure one crop following the other very closely.

A Rule for Succession Crops. A very simple yet convenient method for keeping succession crops moving in the proper rotation is to make a sowing when the previous one is just above ground.

Setting Out the Tender Plants. If you have not already done as advised last month in planting out from the coldframe some of the more hardy of the vegetable plants, such as cabbage, cauliflower and Brussels sprouts, do it as soon as possible. If any grow too large in the frame or get root-bound they will be greatly damaged. After the 20th, it will be safe to set out tomatoes. You can save more or less breakage by staking the plants right away. Peppers and eggplant will not stand cold nights, but can come out pretty soon now.

Fall Crops. The latter part of May is the time to

Individual cabbage, tomato, and egg-plants may be protected from cut-worms, by means of paper collars, put on when they are transplanted

sow late cabbage, cauliflower, kale and winter celery. You can save time and space by sowing in beds now and transplanting as soon as you clear a row of beets, turnips, peas, or some early planted vegetable. Of course, if you have the space, you can save the extra work of transplanting by starting the plants in their permanent positions. However, you can set a good many plants in a June evening and next fall you will be glad of all the cabbages and cauliflowers you can get.

The Asparagus Bed. Give two applications of salt during May (I use 500 lbs. on a plot 60 x 180 ft.); this will keep down the growth of weeds and the asparagus is benefited. Apply this just before, or during a rain, run the cultivator over the bed two or three times during the month, and exercise a little caution in cutting, and your bed will keep a-going. In cutting, don't jab a knife through the crown, as that splits it into small pieces and causes the shoots to become smaller.

One of the best forms of asparagus knife has a V-shaped edge. Insert it close to the stalk you want, and don't stab the crown

Rhubarb. If rhubarb is thin or stringy it needs attention. Seed pods persistently appearing is also an equal assurance that next fall the plants should be divided and reset. Cut off the seed pods as soon as they appear; but don't cut the shoots, or rather leaves —- pull them off with a downward jerk.

To Hill or Not to Hill? There are several reasons for hilling vegetables. In some cases it keeps plants from blowing over; it also tends to get the roots deeper, where they are not so liable to be affected by dry weather; with other vegetables it is done to blanch the stalks, the better to fit them for table use. But don't hill too deeply. Judgment is necessary, as no hard rule can be fixed, the depth

varying with the season, and the kind of vegetable. Beans, peas, and corn are usually hilled about the same height, four inches; this should be done early as it prevents them from blowing over. Leek and celery should be hilled as they grow. I usually hill okra, as it is brittle and breaks very easily. Potatoes should not be hilled too early; the proper time is when the flowers appear. I advise hilling cauliflower and cabbage up to the bottom leaves, if they were not planted in drills as suggested last month. This is not because there is any danger of their blowing over, but to keep the roots farther from the heat and drought.

Thinning Out. The thinning out of crops such as beets, carrots, etc., must be done when the plants are very small. Go over a row, and pull out the plants between the two points which are to be covered. If you happen to leave two or three in a clump it will not matter very much as they can be thinned again later on in the season.

Approved distances for thinning the plants are as follows:

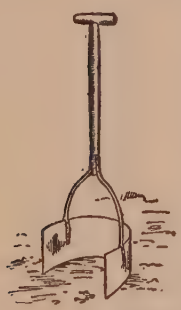
Beans, 6 inches apart
Beets, 3 inches apart
Corn, 3 inches apart, by hill 8 inches in row
Carrot, 3 inches apart
Kohlrabi, 4 inches apart
Lettuce, 9 inches apart
Okra, 8 inches apart
Parsnips, 5 inches apart
Onions 3 inches apart
Salsify, 3 inches apart
Turnip, 6 inches apart
Leek, 6 inches apart

Some of the early sown peas must now be brushed, but never do this until after they have been hilled; and in placing the brush be sure always to slant it.

This gives the vines a better chance to get a good hold as they can climb on several sticks in place of one.

Fruit Notes. None of your fruit bushes should be allowed to bear the first year even if they seem willing. Pinch off the blossoms before the fruit sets and you will send the energy into the roots and body of the plant. As they are expected to last for a number of years, this is only giving the bushes a fair start, but they will certainly show their gratitude later.

Supposing that you are limited for space, I would advise cutting off the strawberry runners to keep the plants within bounds. In a few years when the plants get older, you can pot these runners and get strong, new plants, for nothing. This is done by sinking a two or three-inch pot in the ground near a thrifty plant, and burying one of the nodes or joints of a runner in the soil contained in the pot. This joint will soon throw out roots and new leaves and become an individual plant. It may then be cut away from the parent plant, and be transplanted to larger pots as its growth calls for it. After a winter in the cold-frame or greenhouse, it may be set in the berry patch to bear the following spring. The first season pinch off blossoms. This is the way



The strawberry runner-cutter reduces a matted row of berries to a series of uniform, convenient sized plants. Keep the bottom edge sharp

to increase your plants, too, if you find that you have more space than you expected. I work my strawberries thus:

I set out a bed every year, and leave it for two years — the first year as individual plants from which I get quality, the second in solid rows, where I get quantity. In this way I always have two bearing beds. I would not advise anyone to propagate his own plants continuously, however, unless he has thoroughly up-to-date varieties, and even then it is advisable to change the stock occasionally, as strawberry plants can be bought too cheaply to take any chances with poor varieties or worn-out stock. Do not forget to mix the pistillate and staminate flowering types.

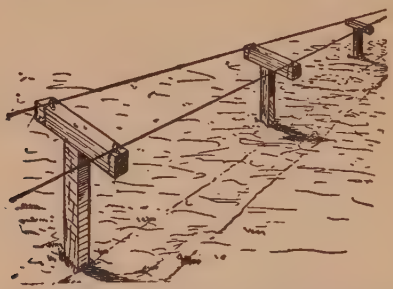
THE GROWING SEASON FOR FRUITS

Don't Forget to Cultivate. The fruits need cultivation all the time until, perhaps, August. You must remember that the first year is a hard time for them, for they are trying to establish themselves under new conditions and every bit of help you can give, counts.

You will not have to prune during the summer except, (1) to rub off undesirable shoots on the dwarf trees, (2) to cut off excessive strawberry runners and (3) remove the blossoms *this year.*

You may decide to spray the brambles and currants as a preventive against the various rusts and leaf diseases. Bordeaux mixture should be used according to the formulæ given in Chapter VII. For caterpillars that eat the leaves use hellebore

rather than arsenate of lead — at any rate *after* the fruit has set. And for the little green aphids,



Build a simple support like this for your brambles, keep the shoots inside the wires, and you will save time, space and many scratches when pruning and cultivating

use kerosene emulsion or the simpler whale-oil soap solution. These directions hold all the season, except that when the fruits are ripening, use ammoniacal copper carbonate instead of Bordeaux mixture, if the leaf spot diseases seem to persist.

JUNE

By this time you will be enjoying some of the fruits of your labors, and realizing what fresh vegetables, real ones, are. If the extraordinary condition exists, that no one in the house but yourself is interested in the garden, you can gather enough for the day's meals before breakfast, wash it and leave it, crisp and cool, on ice, or wrapped in damp cloths or paper in the shade. Otherwise, the vegetables should be picked only when they

are needed, for the garden itself is the best of all ice-chests and storehouses for "green-goods."

A Washing Tank for Vegetables. If you have no place where the vegetables can be washed before taking them into the house and if you do not feel inclined to build a proper washing tank, use a barrel sawed in two, or an old butter tub. But a tank would not cost very much; it could be made as follows:

Dig a hole about eighteen inches deep, three feet long and two feet wide. Build inside of this a tank of bricks, putting a partition in one end, the partition wall being about two inches lower than the side walls. Place a pipe in the bottom of each basin leading to a barrel or other drainage outlet, then plaster the bottom and side walls with cement. Place a cork in the pipe, in the large washing compartment, which is only used to draw off the water in winter. All the sand is held in the first compartment by the partition. Gather the vegetables right into the tank; if you have a half barrel alongside to hold refuse it will help.

When to Gather Vegetables. Most people let their vegetables get too old! There is a proper time to gather vegetables and there is also an improper time; there is a proper way to gather them and there is also an improper way. If we gather vegetables too soon we injure the crop in most cases; if we leave them too long, they deteriorate in quality. Sometimes a single day, one way or the other, makes all the difference.

Picking Peas. Do not gather peas until the pod is nicely filled, but not hard; and under no circumstances delay picking until it develops a yellowish tinge, the sign of age. Never pull your peas, but pluck them. Take the pod in the hand and break the pod from the vine with the thumb and first finger. Some pull them with an upward jerk, but this is likely to tear the vine loose from the support and often breaks or loosens it at the root, spoiling the remainder of the crop on that particular stem.

Spinach should be cut close to the ground. If you pull it up by the roots you gather also a lot of dirt, which, when thoroughly shaken in among the leaves, is hard to wash out. Cutting also induces a second growth.

Radishes are best when about the size of marbles; permitted to grow large, they become hollow and often have a very strong flavor.

Cabbage can be used as soon as it is well headed. Always select the hardest heads for cutting; this will save you from losing a quantity later on by their splitting.

Watch *cauliflower* carefully when it starts to head; if left too long it gets rough. To get pure white, tender heads, gather the leaves up and tie around them with string or raffia, as soon as a bud begins to thicken in the centre. Be sure the heads are dry at this time, or they will certainly rot. No particular size can be specified as the proper one for cutting, as it will vary according to season, soil and cultivation; but I

never allow the heads to get any larger than six inches across.

Pick *beans* when about two inches long. Don't wait for the pods to develop strings or large seeds inside. All the preparation necessary for cooking is to pinch off the ends, and the beans should be in such a condition that this can be easily done with the thumb and first finger.

Beets develop white lines or rings and lose their flavor when cooked, if they are allowed to get tough and woody. They should be used when about one inch in diameter. Be careful not to break the small root when gathering, as that will cause bleeding.

Carrots should also be used when small; they are usually ready for use when about one-half inch in diameter at the top. If larger than that, they will have developed a core and have lost the deep yellow color.

Swiss chard should be cut. Take the head in one hand and cut it off clean, but be careful not to cut low enough to injure the crown.

Start gathering *onions* now from the sets. Select the largest, so as to keep them from running to seed.

Kohlrabi and *turnip* should now be ready for use. They get strong in flavor with age.

When selecting *lettuce* for cutting, look over the bed carefully and select the hardest and largest heads, as they are the best eating and will also be the first to run to seed.

Toward the end of the month look over the

early *potatoes*, for some may be ready for digging. Don't dig them when very small; they should be the size of hens' eggs at least.

Be careful when cutting the *asparagus*. You cannot do this the first year unless you have very strong, old roots. In any case it is far better to begin gradually, the second year. Commence to ease up on the bed a little by letting an occasional shoot grow instead of cutting it off. Discontinue cutting entirely after the middle of June. I usually stop when peas come into bearing. By cutting later than this, you surely shorten the life of the bed.

Special Care for Melons. Pay strict attention to ventilating the melons, and just as soon as the vines fill the box they are in, they must be gradually hardened off, so that the boxes can be removed. Begin by leaving about one-half inch of air space on the frame all night, and keep increasing this amount for about a week, when the sash can be entirely removed, also the boxes. Spread the plants out evenly, being careful not to crack any of the stems; pin each vine in place with a twig bent V shape, but don't jam these down hard on the vines. Simply stick them into the ground far enough to hold the vines in position. Dig over the space between the hills, adding some lime if the ground is sour. Look over the vines every week and keep them placed so that they will cover the bed evenly and not grow in one big bunch. The vines can be trained among the hills of late potatoes and corn, if you are prepared to gather the

latter carefully, and in time to give the ripening melons plenty of sunlight.

Sowing and Planting. If you haven't sown Lima beans, do so at once, for it is not yet too late to get a good crop. In fact, they can be sown as late as the middle of June, but, of course, it is better to do it earlier.

If you have sown seeds of late cabbage, cauliflower, etc., in beds, they must now be transplanted either to the row in the garden where they are to remain or to a prepared bed from which they can later be transplanted into the garden. The only advantage in this latter method is that you are sometimes short of space, and planting in a bed and then transplanting gives an opportunity to get rid of an early crop.

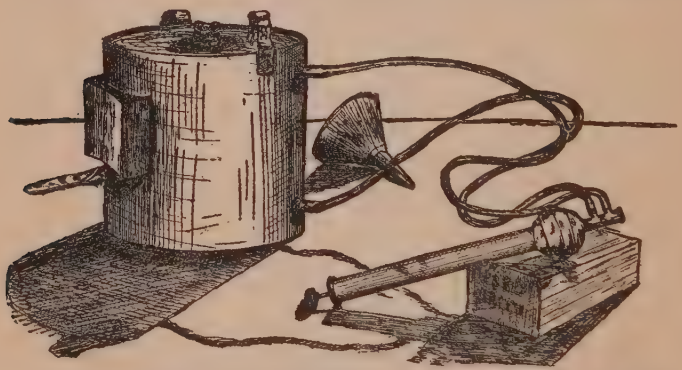
Eggplants and peppers can now safely be set out. If any cold nights follow, place an inverted flower pot over each plant till morning.

Make two sowings of beans this month, also of beets, carrots, corn and cucumber. Sow lettuce and radishes every week. Discontinue sowing peas and spinach, as they will not grow during midsummer.

Supporting the Tomato Vines. A portable tomato trellis will last for years, and is a great asset to the garden. Build it of shingle lath four feet wide at the bottom and three and a half feet high. Train the plants to either side. If you planted the tomatoes three feet apart, make the trellis three feet at the bottom and four feet high.

Looking Out for Insects. No good garden can be

run without the use of a good spray pump. Watch for blight, insects and pests of all kinds and spray all the vegetables that are subject to blight with Bordeaux mixture twice during June. If the weather is either very dry or excessively wet, spray every week. Do not wait for the blight to show itself, as in most cases it is then too late. For eating insects of all kinds, poison must be used. I always mix the poison with the Bordeaux, which helps it to stick to the plant. Be careful when



In this convenient type of portable spraying outfit, the tank, which hangs over the hip, holds about twelve quarts. Occasional strokes of the pump-plunger maintain a steady, fine spray for several minutes at a time

using this; do not spray it on well-advanced vegetables, such as cabbage which has headed. If cabbage worms are troublesome after the heads have attained any size, I usually pick them off by hand. For aphis, use any of the tobacco preparations as a spray; but above all, keep the Bordeaux going, as it is the greatest of all garden savers.

If you applied soot to the asparagus bed in March or April, you will probably not be troubled with the asparagus beetle; but if you did not do it and the beetle is present, put a few chickens into the asparagus bed and leave them there for a few days. For cabbage worms on young plants use white hellebore powder.

If any leaf eater gets after the melons, cucumbers or squash, use Paris green or arsenate of lead. Use one of these poisons for the potato bug, always mixing it with the Bordeaux in place of water. Watch the beans, celery, cucumbers, melons, potatoes and tomatoes, and do not let them be attacked by blight. Bordeaux is the preventive. For aphis on peas, use tobacco or kerosene emulsion.

Watering and Fertilizing. Water the garden constantly if the weather is dry, and don't merely sprinkle. Wet the ground thoroughly, then cultivate as soon as possible to retain the moisture. I use sprinklers in my garden, letting them run night and day, changing their positions every few hours and selecting an especially dry spot to let them run on all night. If you haven't running water in your garden, don't use pump water direct from the pump, as it is too cold at this time of the year. Pump a couple of barrels full and let the water stand for an hour or two before using it.

Give an application of nitrate of soda to all crops that are to stand throughout the season, such as Lima beans, parsnips, etc. This fertilizer comes in the form of white crystals. Crush it to a powdery form and scatter it along the rows, close to the

plants. As it is expensive, buy about ten pounds at a time, making it go as far as you can, without skimping. This encourages root action and renews growth. Keep the cultivator working. It is not only the best protection against dry weather, but also keeps the weeds in check.

Fruits. Currants may need some spraying this month. Use arsenate of lead, or Paris green, if you feel more at home with it.

Strawberries. After your strawberry bed has borne two crops (that is when it is three years old) you might as well plow it up and use the ground for something else. This presupposes that you have another section of the bed coming into bearing next year. It is a very nice plan to spread straw or hay around your plants for the berries to rest on. It keeps them clean and helps them to ripen evenly.

July

Fighting the Heat and Drought. The usual July condition in the vegetable garden is merely a survival of the fittest — the weather is both hot and dry. If possible, artificial watering must be done. Of course, there is nothing to equal a good, natural rainfall, but rather than let the crops die, give them plenty of water at any or all times of the day, even though it be cold spring water. When you do give water, give freely. Plants are like animals; when they are dry and thirsty they want a real drink and not a mere spoonful; therefore, if the weather warrants it, keep the sprinklers going all

the time. The heat-loving vegetables, such as eggplant, corn, etc., can get along with very little water; but celery, lettuce, cabbage, etc., must be watered abundantly, and not being heat-loving plants, will not be shocked in any way by cold water. Keeping the cultivator working incessantly will lessen the labor of watering by conserving the moisture already in the ground.

Late Transplanting. If any of those last-named vegetables were planted in the seedbed and later dibbled in a bed made for that purpose, they must now be transplanted to their permanent places in the garden. In shifting, always use plenty of water and thereby avoid "stub" or branched root. If the plants are seemingly a little large for transplanting, and there is any danger of their suffering from the shock, cut off the outer leaves, but do not cut the heart.

Celery Care. The one crop to be given most attention now, however, is celery, especially with the idea of succession for later use. Keep the early celery well watered, and cultivate frequently. An application of nitrate of soda (one ounce to three gallons of water) will keep it growing fast. Keep hilling as it grows, but be careful not to get the soil above the heart. Do not wait for blight to appear before you spray with Bordeaux mixture. Keep right on setting out late celery as fast as you can find room for it in the places left vacant by early vegetables.

Onions are not deep rooters and stand an abundance of water and feeding. Give them, twice a

week, used alternately, manure water and nitrate of soda, or sulphate of ammonia in solution. If you use the chemically pure, a 6-inch potful is sufficient for a barrel of water. In order to have big stringless parsnips never let the plants suffer for water. Give them a good shaking up occasionally with some soda.

Don't Forget the Asparagus Bed. Asparagus plants will now be building crowns for next season's growth, and the bed needs attention, because the better the crowns the better the cut next year. Give one application of salt during the month at the rate of one pound of salt to every twenty square feet, or 500 pounds to a 60 x 180 ft. bed. If the bed looks poor and hasn't a healthy, dark green color give one application of nitrate of soda, using one pound to 100 square feet. Apply it during a rainfall so that it will dissolve at once. Look out for asparagus beetle; if it appears, dust the plants with hellebore powder, early in the morning when they are still wet with dew, or spray them with Paris green or arsenate of lead.

Ripening and Picking Melons. Now is the critical stage in the growth of a melon vine, for the fruit is swelling fast. Use Bordeaux as a preventive against any possible blight and if dry weather is bothering the vines water the roots thoroughly. Do this in the morning after the sun gets strong. Toward the end of the month some of the melons should be ripening. Look over them carefully but never pull a muskmelon from the vine — it will part easily from the stem when ripe. If you

have a good place in which to ripen them, such as a hotbed or an empty greenhouse, pull the melons from the stem when they are just starting to crack where the stem joins the melon. Placing them in a dry heat of about 120 to 130 degrees, for a few hours puts flavour into them and ripens them to the outer skin. In looking over your melons, always pick off any leaves that are diseased and, when the melons are about the size of baseballs, lift them and place them on boards so as to have them ripen evenly. Use a shingle cut in two. One good application of nitrate of soda when the fruit is swelling will help the plants considerably.

Watermelons require very little attention, as they are robust growers and very free from attacks of insects and diseases. If the vines show any signs of flagging give an application of manure water and follow with nitrate of soda, but do not do this until the fruit is set. If you do, it will start growth anew and you will lose a couple of weeks.

Keep the tomato vines trimmed. Cut off the laterals, except two on each stem if it is necessary to cover a trellis; leave only one stem if you have planted them close together. Never let the plants get dry nor excessively wet at the roots, for either extreme will cause the tomatoes to decay in the centre and drop.

Keep the potatoes growing by good cultivation, and spray with Bordeaux. Use Paris green in case there are any bugs on the plants. Give the final hilling when they are in flower. I prefer flat

cultivation until then. Look over the squash and pumpkins for leaf eaters and spray with poison.

What to Sow in July. Early corn will now be ready for use. Look at Golden Bantam first and use care in selecting the ears. I can tell by feeling an ear whether it is ready for the table or not, while some determine it by the silk; this is not so sure a sign as the firmness of the ears, as some varieties ripen the silk earlier than others. Get acquainted with the other method. It is safe to sow *corn* as late as July 15. Use two varieties, the early and second early; if one does not mature the other will. Sow the rows of the early variety about two feet, and the second early varieties two and a half feet apart. It will then be an easy matter to protect some from early frosts.

The spring crop of *peas* is almost gone, but toward the end of the month you can start sowing again, using early varieties. Remember that the secret of success with late peas is never to let them suffer for water.

Make the last sowing of *cucumbers* about July 15. If you take care of these by spraying with Bordeaux mixture they will last until frost. Pick off any diseased or blighted leaves when you are going over the vines. *Eggplants* and *peppers* should now be ready for use. If the plants get tall and the garden is exposed to winds, stake them to prevent breakage.

Sow *endive* twice during the month. The best variety is the broad-leaved Batavian, which the French call Escarol. When the young seedlings are large enough, set them in rows the same as lettuce.

Keep the *leeks* hilled up as they grow and feed constantly with liquid manure and nitrates.

Make two sowings of *bush beans* during the month. Keep the early sowings well hilled and if the ground bakes to any extent, mulch. Keep the leading shoots of the *Lima beans* tied to the poles until they start climbing of their own accord. Look over the bush Limas for an early picking toward the end of the month, and do not let the beans get hard and dry. Lima beans should be green and not white when cooked.

Sow *lettuce* three times during July and keep the young seedlings well watered. In fact, all lettuce should be kept very moist to prevent it from running to seed too quickly. If you haven't planted them in a shaded place, build a cheesecloth frame over the plants that are beginning to head up and make a habit of spraying them night and morning during the warm weather. This is the secret of good, crisp lettuce.

Make two sowings of *beets* and *carrots* during July. Keep all the sowings well thinned and see that this is done when the seedlings are small. Keep these two vegetables well watered, especially the beets.

Sow *rutabagas* for winter use during July. The early part of the month is the best, but if you are short of space it can safely go for a week or two.

A FEW FRUIT DUTIES

Thinning Fruit. As long as you are raising fruit you will want the best. So in future years, when

your trees are bearing heavily, thin your peaches, plums, pears and apples. Take out perhaps one-third of the young fruits, if there are a plenty, as there should be, and watch the others try to fill the space. The chances are they will nearly succeed.

Bag the Grapes. To improve the quality in grapes bagging is an excellent plan if you can afford a little extra time. Use common brown paper bags; gather the neck around the stem and pin it there. The bunch will be protected from insects, disease, sunburn and birds.

Keep up the Cultivating. After this month you had better stop, so do a good job while you are about it.

Pruning. The raspberries and blackberries should be cut back to 2-½ and 3 feet respectively to cause side branching and good stocky growth. The idea in growing these bramble crops is not to have as big a bush as possible, but to maintain only the strongest canes and to keep these producing to their maximum capacity.

AUGUST

The careful, persistent gardener is now reaping his harvest of corn, Limas, celery, tomatoes, egg-plant, peppers, etc. Something different may be had for every day in the week. But because of these results, do not rest. The weeds must be kept down.

Blanching Celery with Boards. Early celery should be ready for blanching. Some gardeners earth up the plants, but I have found it causes decay at this season, particularly if a heavy rain

follows the hilling-up process. Boards are easy to put in place and are cheaper than hilling with dirt because they can be used continuously and shifted from one part of the row to another. Take two 12-inch boards, place them against the celery and as close together as possible without cracking the stalks, and drive a few stakes down into the ground on the outside to keep the boards in position. This will give a well-blanched heart. If you wish to blanch the entire plant, have the side boards come up high enough to support another board across the top to exclude the light. When I do this, however, I find that the outer stalks are invariably tough and stringy, caused by the plants growing during warm weather.

The Hilling Method. With late celery it is quite different; the entire plant can be blanched and all be of good quality. Hilling-up must be attended to with regularity; moreover, it must be done often and well, for more celery is ruined by poor, indifferent hilling than by any other cause. The idea in hilling celery is that the soil should be kept drawn up to the plant as it grows, but none must fall into the heart or between the stalks of the celery. The first step is to take a digging fork and loosen up the soil on each side of the row. Then remove any suckers or shoots that appear between the stalks, grasp the plant with one hand and hold it tightly to keep the stalks close together. This will prevent soil from getting in the heart or between the stalks. Draw some soil up to the plant and press it firmly against the stalks, using

your fist or a brick. Be careful that you do not scratch the stalk in any way; scratches make dark, rusty spots on the stems and can be easily avoided with a little care. Also keep any stones from coming in contact with the stalks, as they also will scratch. Never hill your celery when it is wet, or in the morning when the dew is still on the plants, as the moisture will soon start decay.

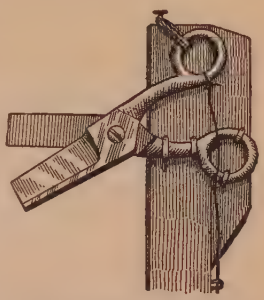
Keep the Celery Growing. Keep celery well watered at all times. Lack of water makes strings; good, quick growth makes celery that cracks in one's hand "like a pipe-stem." An occasional watering with liquid manure will keep the plants growing fast. Use a half-bushel of manure (cow manure is preferable) to a barrel of water, letting it stand for forty-eight hours before using. Then thin it down to about one half strength. A dose of nitrate of soda is also beneficial. Use a 6-inch flower pot of soda to a barrel of water, and apply as soon as dissolved.

Seeds for Present Sowing. Sow *bush beans* twice during the month — once on the first, and again on the 15th. Put in several rows at each sowing, and place the rows about fifteen inches apart, so that it will be easy to protect them from the frost later on, for which purpose start collecting old burlap and covering material now.

Make the final sowings of *beets* and *carrots* about August 1 to 10, for a winter supply. Be sure you put in enough seed. I have found that by sowing at this time the vegetables are of good size and excellent quality when harvested. I use

Guerande carrot and Eclipse beet, but any of the good standard varieties will be satisfactory.

At this time recall the method of thinning carrots and beets that was advocated by one of the successful gardeners in an earlier chapter. Remove first the spindling, weak seedlings that are obviously of no use; then wait for the plants to become slightly crowded and pull out the largest of these. Such carrots and beets are usually fully large enough to be used; thus they have not been wasted in the thinning, and plenty of room has been provided for the latter growth of the remaining roots.



This pruning pole made of a pair of broken scissors, some staples, wire and a rubber band, is cheap and efficient for light summer work, though not strong enough for severe, hardwood pruning

Sow *endive* and *lettuce* twice during the month. Keep setting out the young plants from the seed beds, and do not let them suffer for water. Put them in between the celery rows. Make two sowings of turnip and kohlrabi, if you care for these vegetables. The former is excellent for soup making, and the latter is a good spring and fall vegetable.

Sow *peas* twice during the month, using the early varieties, such as Nott's Excelsior or New York Market. Keep them well watered and watch out for the aphis. If it appears, spray with a good standard tobacco preparation. Directions for use always accompany such preparations.

Start sowing *spinach* now for a fall crop. I always sow spinach when I sow peas, putting the rows of peas three feet apart and planting the spinach in between the rows. Both these are spring and fall crops, and grow well together.

Do You Know a Ripe Watermelon? In order to determine this (for watermelons do not leave the vines when ripe, as do muskmelons), select one of the largest melons, place both hands on the top and press downward. Do not place the weight of your body on it, but give a quick, downward pressure. If the melon crunches it is ripe and ready for eating.

Harvest the Onions. If the tops of the onions have turned yellow, pull them up and lay them on their sides in rows, so that the sun can dry them out a trifle. Leave them so for several days. Before storing, twist the tops off by holding the top in one hand close to the bulb and twisting the bulb with the other hand. Store in a cool, dry place and look over them occasionally to prevent growth from starting and to discover and remove any that may have decayed.

The Crops that Must Keep Growing. Keep the winter root crops, such as parsnips, salsify, rutabagas, carrots, beets, etc., well watered. Growth should be kept up for at least this month; after that, parsnips and salsify will have practically stopped growing; rutabagas, carrots, etc., will grow in September whether the weather is dry or not.

Blight in the garden should still be watched for, and spraying should be continued regularly during August. After this month blight will not be very

troublesome. Use Bordeaux mixture and spray every ten days to two weeks.

Watch eggplants for potato bugs. I always pick them off, for I am rather timid about using poison on anything but root crops when the vegetables are about ripe and ready for use.

Begin to Save Manure Now. In fact do this as soon as you gather any crops from which you get waste parts. Pea vines, turnip and carrot tops, waste lettuce leaves and all such refuse (unless you can feed it to hogs) will increase the value of your manure when well mixed and rotted. It will be worth while to make some sort of permanent manure pit, which will serve also as a rubbish pile. Such a pit can be built in one corner of the garden, and will pay well for the room it takes. If possible lay a cement floor or make a pit a couple of feet deep lined with concrete. If this is impossible, much valuable material is likely to leach away. Enclose or roof it in some way, so that the rain and snow cannot beat in upon the compost. Add manure to the pile whenever you can get it, also sods, lawn cuttings and now and then a little loam. If you have access to liquid manure from the horse or cow stables, add it plentifully to the vegetable matter. You can prevent any odor from this pit, by covering any fresh additions of manure or refuse that will quickly decay, with a litttle sawdust, loam, or straw bedding — whatever comes easiest to hand and is dry and fresh. It, too, will break down later in the mass of manure.

Very possibly an excellent source of manure

is being overlooked by the vast majority of suburban gardeners. Make some arrangement for getting the street sweepings from your block or at least in front of your house. In a few months you will have much valuable manure, while the dust that will be included will not be at all undesirable.

Putting the Fruits to Sleep. We cease cultivating around the bush fruits and trees about this time so that they will mature their wood and not remain in a growing and comparatively tender state into late autumn. In large orchards the practice is to sow a cover crop of rye, or clover and plow it under the next spring. If you can dig such a crop well under, it will be a good thing for the dwarfs. I should expect, however, that you would do better to mulch lightly with manure, to keep down the weeds. A heavier mulch added in October will protect the trees over winter.

SEPTEMBER

I would have no one get the idea that a garden, no matter how small, is a lazy man's place. To be exact, is there *any* place where a lazy man gets the best of things? But as September grows older, the gardener, who has put his heart and energy into his work all the season, can really begin to take things more easily. Enough cultivating after rains, to keep the soil loose, will become merely a pastime, but the fight with weeds and bugs will have been about won (or lost?) by now, and very little sowing will need your attention.

Plan Improvements. Go around and visit neigh-

boring gardens this month, making notes of their size and also of the manner in which they are laid out. Ask the successful gardeners what varieties they use in certain crops that are particularly fine, and make a note of it.

Fall Sowings. Radishes can still be sown out-of-doors on the 1st and the 15th. Spinach should also be sown twice, and if it does not mature before cold weather cover it later with hay and it will be a very early spring crop.

If you have a coldframe keep right on sowing lettuce and, as it reaches planting size, transplant to the frame where it can be protected on cool nights. The crop will last until the holidays. If you do not have a frame, however, make only one sowing as near the first of the month as possible. Some folks sow cabbage, cauliflower, and broccoli now, and then transplant to the frames later on, carrying the plants over all winter and planting out in the gardens in spring. There is nothing to be gained by doing this, for you can get as good plants by starting a hotbed in the latter part of February. Spinach and radishes can also be sown in the frame, and will be ready for use before severe weather checks their growth.

Keep right on hilling celery. It is growing fast now and must not be neglected under any circumstances. If the ground is at all dry don't hesitate to water the plants. Good celery cannot be grown in a hot, dry location.

The Handmarks of a Careful Gardener. Keep the cultivator working this month. After September

you can probably dispense with it until another season. Also see that all vegetable plants that are through bearing are cleaned up and placed on the rubbish heap, because otherwise they breed and harbor insects. All places cleared should be sown down with winter rye, a process very beneficial to the ground, but which very few people seem to appreciate. Sow rye in fall for a good heavy stand, and plow it under in early spring.

OCTOBER.

Cover Crops and Insects. October is clearing-up month in the garden. Don't think this is a job that you can skip, and expect to come out lucky in spring. Clean the ground thoroughly, clearing away all refuse. Burn what will burn, and don't leave any lying around to decay and breed insects and pests of all kinds. It is not too late to sow rye in all ground that is cleared; but if you were troubled to any great extent with worms of various kinds last season, I would advise trenching the ground in preference. Trench deep, but wait until you are likely to have a sharp freezing spell shortly after doing so. The trenches should be about two feet deep and the same distance apart.

Getting the Best of the Early Frosts. Usually about the first or second week in October, we have a killing frost. This lays low all tender vegetables, such as beans, corn, etc. Then a few weeks of good weather is likely to follow. It seems a great mistake to let this first frost rob us of our gardens. When you are confronted by steady freezing weather

you must throw up your hands, but there are ways and means of preventing this first frost from entirely ruining the garden. Beans, lettuce, corn, bush Limas, and all tender vegetables can be saved from destruction by a covering of burlap; a pepper or eggplant by a barrel or an old box; and thus made to last a long time. In some gardens a smudge fire is used. The fire is always placed to the windward of the garden.

Keeping Celery Outdoors. Don't house your celery now; it is apt to get tough and stringy. If you place it in trenches before very cool weather is here, it is likely to rot. If you leave it out-of-doors it gets nipped with the frost, and while celery can stand considerable frost (in fact, frost improves the flavor), it cannot stand heavy freezing, especially if the sun hits it right after it has been frozen. I have a scheme which I have tried for two seasons, and it works to perfection. I never store my celery before the middle of November, but during the early frosts of late October and early November I cover it with salt hay. I don't leave the hay on the plants. I always remove it the next morning; in fact, there are few nights when it is necessary to put it on, but those few nights are just enough to ruin a nice batch of celery. By this method I don't need to store my celery before the ground gets cool. The crop is well hardened up, and the cool nights have put flavor into the stalks that can't be done any other way. Celery thus hardened and handled will never deteriorate one particle; I take celery from the trenches

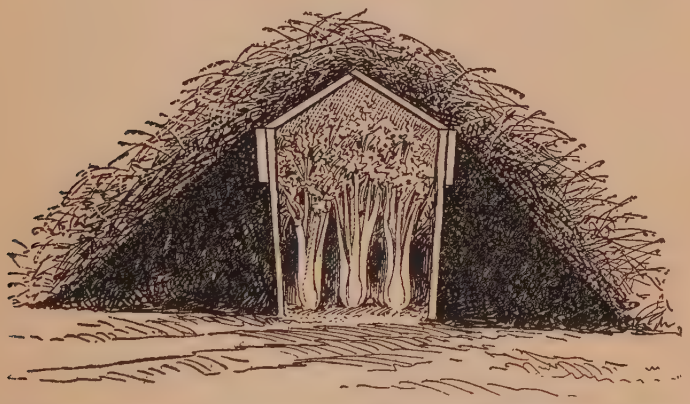
in March that is just as solid and as fine as when placed there.

Storing Roots. Some of the root crops can be stored during October. Beets, carrots, salsify, etc., can all be lifted now, the tops cut off, and the roots placed in trenches for the winter. Don't do this during wet weather, as root crops should go into the trenches dry — that is, there should be no outside moisture on the roots, or they would decay. I always store my root vegetables in outdoor trenches. Some growers put them in the cellar; they keep well there, but are apt to dry out considerably and thus lose a certain amount of their flavor. By storing in trenches, although perhaps a little more troublesome, the vegetables are kept moist, and therefore retain their good qualities. In fact, after cooking, I defy any one to tell me the difference between a fresh grown beet and one taken from an outside trench.

To prepare a trench, dig a space the size required about three feet deep and place the vegetables in fixed places, so you will know later on where they are. Save room for parsnips and turnips and salsify, as these vegetables to get their best flavor should be left out doors until they have been frosted. Then cover with about one foot of hay and sprinkle a little dirt over this to keep it down. As cold weather advances keep adding some hay and a little dirt — leaves will do just as well — and always sprinkle some dirt in among the vegetables before covering them up, as this helps to keep them moist.

NOVEMBER

Storing Celery for Winter. The most important work to be done in November is storing the celery crop for the winter. There are several important points to be remembered. First of all it must be kept from freezing, and free from excessive moisture; both will cause it to rot. On the other hand it



By this method of storing celery but one final lifting is made necessary, and the plants, while protected, retain every bit of the flavor and quality of the freshly dug, still-growing vegetable. Increase the amount of litter as your climatic conditions warrant. (See page 209)

must not be kept too dry or too warm, or it will get tough and stringy and lose that rich nutty flavor. It should go in the trenches with the roots in a fairly moist condition, and the stalks dry.

I have tried storing celery in almost every conceivable way—I have stored in cellars; I have built low shed roofs where protection could be afforded

from the weather, yet a low temperature maintained by means of ventilation; I have left it in the trenches where it was growing and have covered it with dirt, leaves and litter. But where a lot of celery is grown for winter use I prefer putting it in outside trenches. I make one trench large enough to accommodate the entire crop — and cover the celery with dirt, and later with leaves and litter.

The Celery Trench. A trench is staked out about ten feet wide, as long as desired, and about eighteen inches deep, the soil being thrown to one side until needed again. I then lift the plants with a ball of earth. Some growers shake the celery so as to remove the dirt; this may be all right when the crop is grown on a large scale for market, and quantity not quality is the maxim. If you want the best celery, leave the soil on the roots, and if it is moist it will supply the celery with what little moisture is required in the trench. Pack the plants in the trench one row at a time, and just far enough apart so that they don't touch each other. Then if one head rots, it won't spoil the adjoining ones. Cover the row with enough soil to prevent the next row from coming in contact with it. The soil used for covering should be moderately dry.

After throwing the soil on the row, firm it slightly with the foot, place another row in position, and so on until it has all been stored. Sprinkle the soil over the plants on top, and give it an opportunity to work its way down among the stalks. Don't

throw it on, but fill the shovel and hold it over the celery, rocking it from side to side so that no stalks will be broken. Don't forget that the plants should be perfectly dry. Do not do this work in the morning, but let it go until noon so that any moisture that has gathered in the hearts over night, may dry out. If the plants were to be stored in a cellar, a little moisture wouldn't be harmful, but even then, if there is any present in the heart, it is liable to start decay.

After the trenches are covered with soil, about a foot of leaves or rough litter is added, which in turn is covered with about four inches of soil. The leaves or litter form an air space through which it is hard for frost to penetrate. The celery will keep just as well if enough dirt is piled on top to prevent freezing, but it would necessitate considerable digging when the celery was wanted for use. By using a layer or two of leaves or salt hay or anything of that nature that will not pack solid, frost will be kept out just as well. The trench should be mounded up in the centre so that all moisture will drain off.

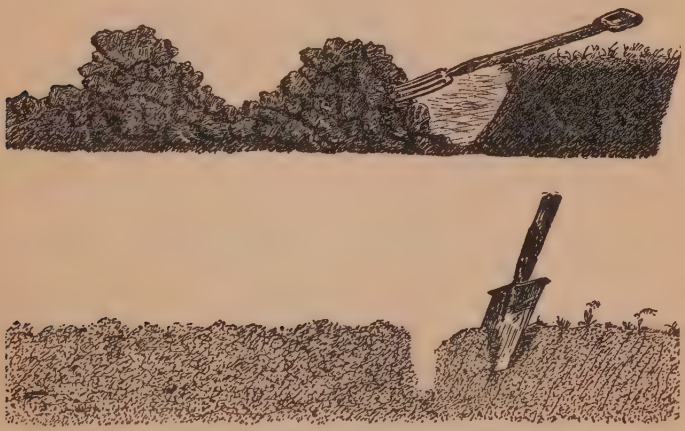
In the Very Small Garden. For a very small garden, where but a few plants are grown which are usually disposed of by the middle of January or thereabouts, I would advise covering the celery in the trenches where it is grown. This saves the trouble of lifting and storing the plants, and the celery keeps better than if kept by any other method; but, as I said before, it is more trouble to get it out of these trenches when you need it. In small

gardens, where but a few heads are required at a time, this is not much of a consideration. Cover the plants to the top with earth and cover liberally with litter or leaves, throwing a little soil on top to keep the leaves from blowing away. This will be found sufficient for any ordinary weather, but if real winter sets in and you still have celery in the ground, don't hesitate to use more litter. The frost *must* be kept away. But with all possible care a few heads will get frozen. Don't throw them away, but plunge them in cold water out-of-doors and if they are not frozen too badly, this will thaw them out and make them fit for use. Don't put frozen celery in the sun; in ten minutes it will look and taste like a wet rag.

A Good Time to Fight Cutworms. Any bare ground can be trenched now for the winter; this will do more to rid the soil of cutworms and other pests than all the various things recommended for doing it in spring. By waiting until now, you catch the worms before they have an opportunity of going deeper, as they are asleep for the winter. Make the trenches about two feet apart and two feet deep. Or else plow the ground well, using a subsoil plow so as to loosen the ground as deep as possible. Trenching, however, is preferable.

Mulching Strawberries. Now is the time to cover your strawberry bed for the winter. After the ground freezes mulch with a few inches of well-rotted manure. The plants will get the benefit of it, for the winter rains will wash the fertilizing qualities into the ground, and the roots will

devour them in early spring. In placing your mulch always keep it away from the crown of the plant as it causes decay if it gets in there. After the mulch has been applied, cover the bed lightly with an inch or two of salt hay or straw. If this is put on too heavily it will pound down the plants and



Showing the difference in the methods of handling heavy and light soil. Ridge up the former in the fall with a fork—the frost action all winter will help to pulverize it. Dig light, sandy soil in the spring with a spade. It is inherently loose and tillable

make them suffer for lack of air. Lay a few light twigs on top to keep the straw from blowing around. Bean poles are too heavy; use pea-brush.

Mulch the bush fruits at the same time, using good manure and putting on about four inches of it.

Both these mulches can be removed in March, and the beds dug up thoroughly. Work manure

into the ground, as deeply and as close to the plants as possible, but avoid cutting many roots. Better to get the manure in *deep*, a little away from the bushes, than to cut roots or leave the manure near the surface, where the roots would follow and probably get sunburnt, or, at all events, would dry out quickly.

Tender Varieties of the Brambles are to be bent over, and their tips sufficiently covered with earth

The grape vine in late autumn before being pruned

to hold them there. If you are in a very cold locality, spread a little litter, straw or marsh hay over these, as an added precaution. All dead wood and old stiff canes should be cut out previous to this covering.

Apples, Pears, etc. Now is the time to really dwarf the trees. Cut back side shoots and branches (in the case of tree forms), or trim back all extra lateral growths on the branches of the espaliers

and cordons. If you don't mulch these, hoe up the earth about them.

This is one of the two planting seasons (until

Prune grapes while the wood is dormant—between November and March. Leave a few shoots to carry the fruit higher on the trellis. In severe locations these may be laid down and covered

the ground freezes), so if you get hold of some new trees or bushes, don't hesitate to plant them, taking the same precautions as for March planting.

VI

THE SIMPLICITY OF SELF-MAINTAINING FERTILITY THAT EVERYONE CAN HAVE

THERE are two principles and practices which have been mentioned repeatedly. One is the vital importance of cultivation, of keeping the soil loose and friable at all times. The other is the imperative necessity of an intelligent use of fertilizers. With these two essentials properly attended to the ideal garden is nearer realization than all other sets of conditions put together can bring it.

And yet I wish nothing less than to make these subjects bugbears to the backyard gardeners, any more than to the farmer of broader acres; to make him feel that he must give hours of study, experiment and thought to the questions before he can make his garden successful. On the contrary I want to emphasize, and I want you to realize, the simplicity of it; to realize how many scientists and painstaking investigators have done these very things with the result that the knowledge is available to you in brief, compact, definite form, such that you need only acquaint yourself with a few facts and practical instruc-

tions, then use, apply them, and reap bounteous rewards.

PLANT FOOD THAT NEVER RUNS OUT

In a general way we can say that fertilizers furnish nutriment for plants, just as does food for people. There is a certain, or rather, varying amount of plant food at all times in nearly all soils, just as each house contains more or less provisions; or to make the simile more accurate, just as a gardener has some *potential* food in his growing vegetables. They, however, take time to ripen and become edible; so, too, the plant food in the soil needs time in which to become available for the plants. Hence while the housekeeper saves time by furnishing the family with purchased steak, condensed milk, soups etc., the gardener supplies plants with rapidly soluble fertilizers, liquid manure, etc. For, you must know that plants obtain all their food in the form of solutions, the dissolving agent being the moisture in the soil.

We can go a step farther in the comparison. The unavailable material in the soil must be changed and prepared for assimilation by the plants; the raw, unprepared food in the kitchen must be cooked, mixed and prepared for the table. In the kitchen are cooks who do this work; in the soil are bacteria or "microbes" which do the same thing with the plants' "uncooked" provisions.

Of these "soil cooks" there are several general groups. The first accomplishes what is called *nitrification*, the breaking down of complex combina-

tions of carbon and nitrogen, of which manures, humus and other animal and vegetable wastes are composed. This oxidizing change results in new combinations, of nitrogen and a maximum proportion of oxygen, which are directly assimilable by plants.

The second group, of "nitrogen fixers," possesses the power to act on gaseous, atmospheric nitrogen, and with it to build up the compounds which mark the beginning of the nitrification process outlined above. These latter organisms are themselves of two kinds: first, those which have entered into partnership with certain plants — the legumes, such as beans, peas, etc., in which they store up the plant food, the accumulations forming nodules or tubercles on the roots of those plants; and second, those which accomplish the same results, but without the assistance or coöperation of growing plants. You will probably by this time have realized why the growth of leguminous "cover crops" is of such benefit to the soil.

THE GREATEST SECRET OF ALL

Now the grandest part of all this is, that this work and all these changes are going on in the soil *all the time*. Plant food is being prepared at all hours of the day and night, and there is enough raw material on hand to last for many a year. The only way you can possibly stop the great work of the bacteria is by shutting off their air supply, by drowning them or by poisoning them with acids just as

they are rendered powerless in swamps and cold, wet, sour soils. You can give them increased life, increased vigor, increased efficiency, by adding to their air supply, by — keeping the soil loose! And there you have the whole, simple key to the entire secret of plant-food production. Cultivate the soil, help the bacteria to grow and work, give them, occasionally, manure to work on and *they* will feed your plants. And then, if you wish to augment their effects and to still further stimulate vegetable growth, you can use liquid manures, prepared fertilizers, and the like, just as you use beef tea, canned goods, etc., to supplement the efforts of the cook and the gardener.

WHAT CERTAIN PLANTS LIKE BEST

It would be perfectly true to say that any kind of fertilizer will help plants grow. But it would not be a sensible nor an economical statement to make, any more than you would say that any kind of food is best for every person. As there are preferences among persons, so too there are special needs among plants. In the garden are a few distinct types of vegetables, each of which appreciates a little different treatment. You might just as well know these, and thereby be enabled to act intelligently and to get the best possible results when you do fertilize.

Group 1. Tubers and roots, including potatoes parsnips, carrots and beets. These need less manure (meaning coarse mixtures of bedding and horse,

pig or cow droppings) unless it be in very fine condition or applied to the previous crop. Apply commercial fertilizers at time of planting or soon after.

Group 2. Quick growers, of fleshy tissue, near the surface, such as celery, onions, turnips and radish. These use plenty of rich manure, well worked into the soil. Onions thrive on applications of wood ashes.

Group 3. Coarse feeders and growers, including cabbage, spinach, cucumbers, tomatoes, squash, etc. These are the great manure users. Supply it bountifully in the hills when planting. Spinach and lettuce will make good use of nitrogen fertilizers and the last three need plenty of potash after they start growing.

Group 4. Beans, peas, etc., which develop a large leaf and stem surface, and of which the seeds are used. These plants obtain their own nitrogen as explained above. However, they like a light soil which manure produces, and require a generous amount of potash and phosphoric acid.

Knowing these special requirements you can feed for the greatest possible results, easily, economically and with understanding.

FERTILITY THAT EVERY GARDEN CAN HAVE

Manure fills a number of wants in the soil. It supplies nitrogen or rather nitrogenous compounds to the nitrifying bacteria. It supplies a certain, although a smaller, percentage of the other essential plant-foods, potash and phosphoric acid. And finally, it adds to the supply of humus, or

decaying vegetable matter, which is one of the essential elements of a productive soil. The functions of this vital humus are (1) to lighten and loosen the soil, and (2) to absorb and hold moisture, thereby rendering more constant the water supply therein. If you have a heavy clay soil that tends to puddle and bake, plow or dig under a crop of rye every fall, and plenty of manure during the summer, then watch the transformation. On the other hand this wonderful humus will do just as much good to an extremely light, sandy soil, through which the moisture drains too rapidly, and which is almost devoid of raw plant food.

AVAILABLE MANURE FOR EVERY SMALL GARDEN

Street sweepings are almost always available, and if mixed with lawn cuttings, leaves, etc., make excellent manure. It has been found, by the way, that horse manure is about one-third more valuable than that of cows or hogs. Of course, if you keep a horse or cow, you will have plenty of these materials; if not, you can generally buy them from livery stables, but try to get manure that you have reason to think is free from weed seeds and is fresh. You will probably be able to keep it with less loss than they would in the stable yard, so don't make a fuss about getting "well-decayed manure only." If hogs can work over the manure, they will both enrich it and improve its condition. As I have already said, compost all the vegetable waste from the place, with whatever manure, table scraps, etc., you save.

THE SIMPLE ART OF USING MANURE

This question is easy. Use it (1), well decayed, (2), *abundantly* and (3), worked well into the

To make liquid manure, hang a basket of coarse burlap or wire netting in the top of a barrel. In this put horse or cow manure, then pour water through it and let all the value seep through without clogging up the spigot. Keep the barrel nearly full all the time and the solution will maintain its strength and effectiveness

soil. Abundantly doesn't mean a few wheelbarrow loads, but about all you can get. And from fifty to one hundred tons per acre is not too much, though that represents about a ton and a half on a patch 25 feet square. That, I say, is good, but, if you

cannot get that much, use all you can and make up the difference in future care.

Fresh manure is hot — that is why we use it in hotbeds in place of steam pipes. It is also the reason why we want only well rotted manure for use (as a food only), with growing crops.

Mix it thoroughly with the soil, so that the plant roots will have to spread out to reach it. In this way, a better root system and a greater feeding surface are developed. This prevents also, any possible burning of tender root-hairs through contact with a mass of rich dressing.

Spread manure on the garden any time, in fall, winter, or early spring. Then plow it under, either in the fall, or as early as possible in the spring, and cultivate thoroughly. Even if the first crop you raise doesn't get all the benefit it might, the food remains there in the soil for the use of future crops.

SAVING MANURE = SAVING MONEY

Just be careful, first, that the good of the manure is not washed out of it, down the drain; and secondly, that it does not burn and become white. This burning or oxidizing, is just what occurs in the soil *except* that there it goes on far more slowly, and the products remain in the soil, whereas, in the exposed manure heap, the heating is rapid and the resulting ammonia is lost into the air.

To prevent these occurrences, cover the manure pit; and turn the pile with a fork, now and then, or let hogs work it over, or moisten it occasion-

ally, preferably with liquid manure, though water will do.

CONCENTRATED PLANT-FOODS FOR SMALL GARDENS

The three main elements of plant food are nitrogen, phosphorus and potash. All of these can be supplied as commercial fertilizers, in rapidly available forms.

Since they require so little time for preparation, they should be applied only to crops that are growing, or, at all events, not previous to the sowing of the seed. I remember an exasperating waste of some hundred pounds of good fertilizer, which was put on the garden before it was plowed, the stable manure being saved till later by the "gardener"!!

You can apply commercial fertilizer either by drilling it along the rows, or by dissolving the materials in water and watering the ground close about the plants; the latter method is particularly suited to the use of nitrogenous fertilizers.

HOW MUCH TO USE

In the garden you can use commercial fertilizers at the rate of 500 to 1000 pounds per acre, with the best results, depending on the special needs of the crops as listed above. Of course, there is no need of stopping at 1000 pounds. Many potato growers apply a ton to the acre, and don't regret it.

However, planning applications by the acre doesn't help you to fertilize 100 square feet of cabbage

or beets correctly. Moreover on a small area, the mistake of a teaspoonful too much or too little is equivalent to an error of a fraction of a ton on an acre.

By the use of the accompanying table any given quantity from one hundred pounds to one ton per

Amount for 1 acre	Approximate equivalent for 1 sq. yard	Approximate equivalent for 10 sq. ft.	Exact equivalent for 1 sq. foot
LBS.	OZ.	OZ.	OZ.
100	$\frac{1}{3}$	$\frac{1}{8}$	.037—
200	$\frac{2}{3}$	$\frac{3}{4}$	.073+
300	1	$1\frac{1}{10}$	.110+
400	$1\frac{1}{3}$	$1\frac{1}{2}$	.147—
500	$1\frac{2}{3}$	$1\frac{4}{5}$	.183+
600	2	$2\frac{1}{5}$	.220+
700	$2\frac{1}{3}$	$2\frac{1}{2}$	.257+
800	$2\frac{2}{3}$	3	.294—
900	3	$3\frac{1}{3}$	.330+
1000	$3\frac{1}{3}$	$3\frac{2}{3}$	.367+
1100	$3\frac{2}{3}$	4	.404+
1200	4	$4\frac{2}{5}$	.441—
1300	$4\frac{1}{3}$	$4\frac{3}{4}$	.478—
1400	$4\frac{2}{3}$	$5\frac{1}{7}$	.514+
1500	5	$5\frac{1}{2}$	.551—
1600	$5\frac{1}{3}$	$5\frac{9}{10}$	.588—
1700	$5\frac{2}{3}$	$6\frac{1}{4}$	.625—
1800	6	$6\frac{2}{5}$	.661+
1900	$6\frac{1}{3}$	7	.698—
2000	$6\frac{2}{3}$	$7\frac{1}{8}$	.735—
2100	7	$7\frac{7}{10}$	.771+
2200	$7\frac{1}{3}$	8	.808+
2300	$7\frac{2}{3}$	$8\frac{1}{2}$	.845+
2400	8	$8\frac{4}{5}$	.882—

acre may be at once reduced to the corresponding amount per square foot or yard. It is then but the work of a moment to determine the correct amount for any sized bed or garden. Also have handy a saucepan or dipper marked to indicate a quarter-pound, half-pound, etc., in order that the desired quantity may be at once measured out, instead of having to weigh it.

In case the table should not be at hand it may be convenient to know the following rule: Multiply the length in yards of the plot to be fertilized by the width in yards. Multiply this by the number of pounds to be used per acre, point off four places and multiply by 2. The result will be the number of pounds of fertilizer required for the plot in question.

Example: Garden bed 2 yards by 5 yards to be fertilized at the rate of 1,500 pounds per acre. The result of 2 multiplied by 5 is 10, which, multiplied by the number of pounds to be used per acre, gives 15,000. Point off four places — 1.5 — and multiply by 2, giving as a final result 3, or the number of pounds required.

This is not quite as accurate as the table, but it is a great deal more so than guessing.

But don't figure on the gross area of your garden. Measure the rows you are to fertilize, multiply them by say a foot more than the width of the crop, and calculate for that area, which is the real crop area.

The more common commercial fertilizers and those which you can most easily get, are as follows,

(including their valuable constituents, and an average application for small areas):

Plant Food	Fertilizer or Source	Use per Sq. Rod	Notes
Nitrogen	Nitrate of Soda	1½ lbs.	For a solution
	Sulphate of Ammonia	2 lbs.	1 lb to 12 gals.
		2 lbs.	water
Potash	Kainit	1⅔ lbs.	
	Sulphate of Potash	1¼ lbs.	Better for Vegetables
	Muriate of Potash	1½ lbs.	Better for Fruit
	Wood Ashes	Plow in all you can	
Phosphoric acid	Ground rock (acid phosphate)	3–4 lbs.	
	Dissolved bone	1 lb.	
	Basic slag	4 lbs.	

SOME VERY CHEAP FERTILIZERS

Lime is valuable for lightening heavy soils and sweetening sour ones. That is, it makes conditions more favorable for the bacteria cooks. If you have any old plaster lying around use that; it is slower to act but useful just the same.

Salt is a good weed killer, and yet an excellent fertilizer for asparagus.

Wood ashes are excellent providers of potash,

and help to lighten the soil as well. Anthracite coal ashes are useful for the latter purpose in the absence of anything else, but they have no food value. If you can choose, use them in building drives and paths.

MANURES THAT YOU DON'T HAVE TO BUY

The effects of green manures or growing crops plowed under, are in general the same as those of barnyard manure — i. e., the addition of humus and raw plant food. But since they have not even begun to decay, the second effect is much more slowly developed. However, the great value of green manuring for lightening clay sails and giving a "body" to sandy areas should not be lost sight of. If your garden doesn't plow and cultivate as easily as you would like to have it, sow rye, or barley, after you have harvested your main summer crops, and plow all the growth under next spring.

The clovers, like the beans, are legumes, and therefore especially useful in accumulating nitrogen in the soil. Where these are not used, rye, barley, millet or buckwheat is a satisfactory green manure crop.

There have recently been developed strains of cowpeas and soy beans, which require a sufficiently short season to allow their cultivation in the North. These legumes have already been found of much value, but only in the Southern states where the longer season permits them to mature. Keep your eyes open for "cowpeas for northern sowing." You'll find them mighty useful.

THE IMPORTANCE OF BACTERIA — THE SECRET OF UNENDING FERTILITY

I hope you have realized how great this is, from the outline I gave you of the action of these organisms. It is only a short time since the very

These young wheat plants, grown under the same climatic conditions show the effect of soil sterilization. The soil in pot 1 was untreated; that in pot 2 was subjected to toluene vapor for twenty minutes; that in pot 3 was heated to 212° F. The death of bacteria-destroying organisms results in increased bacterial activity and increased plant growth

existence of soil bacteria was discovered. Yet now they are recognized as the foundation of the wonderful changes and actions, both constructive and destructive, that are going on in the soil.

One of the recent, important developments along this line of research has disclosed a remarkable

condition of affairs. It is now believed that while there are many millions of the beneficial bacteria in the soil, yet their numbers are kept in check by another group of animal microörganisms, which feed upon them. By sterilizing the soil (by heating or fumigating), it has been possible to kill these consuming organisms, and to permit a great increase in the numbers of the bacteria, this in turn resulting in a greatly increased plant growth. The simple act of keeping soil at the temperature of boiling water for twenty minutes, resulted in a growth of plants exactly twice as great as that in untreated soil!

KILLING THE SOIL-ROBBERS

Our grandmothers did just this when they baked the soil for their geraniums. They didn't know about the bacteria perhaps, but the result was the same. Whether we can make use of this knowledge in a wholesale way has yet to be learned. But you can bake your hotbed soil easily, and if you do, I can promise you better, stronger, healthier seedlings than you ever raised before. Try it — and do a little scientific investigating for yourself.

"SIMPLICITY"

And finally, do you *now* realize how simple this is for you, while yet so wonderful? Nature, with her bacteria, her wonderful chemical and physical transformations is at work all the time. Leave her alone and she will grow plants, weeds, trees, render

the soil richer and more fertile, clothe the earth more beautifully. Give her your help, your interest, your attention, and she will direct all her energies toward the growth of *useful* plants. She will make your garden blossom and bear fruit as never before, with just a little care, and coöperation on your part. Putting aside every selfish thought of all the wealth, health and happiness that you can get from a little garden in the backyard, don't you really think you owe it to Nature and her work to do *your* part and grow something?

VII

WHAT AILS YOUR PLANTS?

The Insects and Diseases That May Attack Your Vegetables and Fruits, and How to Vanquish Them—How to Make Spray Mixtures

Many books and free bulletins from various sources tell how to make Bordeaux mixture, arsenate of lead solution, etc., but all on the basis of 50 gallons. This is, of course, much too large a scale for most backyard gardens, and it is more or less inconvenient mathematically to reduce all the amounts proportionately. The regular, standard formulas are here given in the quantities that you and I are apt to need in our home garden. The amounts are expressed throughout in terms of every household — the teaspoon, the tablespoon and the Mason jar. You will need nothing unusual to measure with or to mix with.

If possible, in measuring and mixing your spray materials use old utensils and keep them apart for this use. Put them in a safe place. You may use good silver and glassware, and afterward wash it clean, but wash it *very* thoroughly, in hot water.

Arsenate of lead, especially, sticks tightly. It is this fact that makes it particularly valuable as an insecticide: rain does not wash it off readily. Bear this fact in mind when you measure out this arsenate.

BORDEAUX MIXTURE

This is undoubtedly the best known and most widely used combination for the control of fungous diseases. Among the fungicides it occupies a position like that formerly held by Paris green among the insecticides, before the introduction of lead arsenate.

In your garden you'll need it for anthracnose of the bean and cucumber, for leaf spot of the beet and currant, for early and late blight of the potato, and a dozen other ills. Don't forget that any fungicide is a preventive rather than a cure. It must be applied early, before the disease has made a good start.

Standard Formula. The regular formula now in general use calls for four pounds of copper sulphate, four to six pounds of quicklime, and water to make fifty gallons.

To Make One Gallon. Take one heaping tablespoonful of copper sulphate; one and a half rounding tablespoonfuls of quicklime.

This is the equivalent of one ounce of the copper sulphate and one and a quarter ounces of the quicklime. If your copper sulphate is in large crystals, break them up with a hammer until there are no pieces larger than one-fourth to one-

half inch. The lime must be fresh, not air-slaked. It should be pounded up fine with a hammer, unless you buy it already ground up.

Dissolve the copper sulphate in one quart of warm water. Place the lime in a separate vessel, and slake it slowly with a little water. After it stops bubbling add enough water to make one quart in this vessel.

Now pour your quart of copper sulphate solution and your quart of lime solution together into a bucket — but do it this way: pour a little from each into the bucket and then stir, then a little more from each and again stir, and so on. When you've done this, you'll have two quarts of bluish-white mixture in the bucket.

Add to this two quarts of water, making four quarts in all of your mixture. This is now ready to spray. It should be shaken or stirred frequently while being sprayed; and it should be made up fresh each time you spray.

AMMONIACAL COPPER CARBONATE

This may be used on ripening fruit, instead of Bordeaux, without leaving visible sign or spoiling the eating qualities, whereas Bordeaux will persist in more or less conspicuous spots.

Standard Formula. In making up a full barrel of this fungicide, take six ounces of copper carbonate, three pints of ammonia, and water to make fifty gallons.

To Make Two Gallons. Take two barely level teaspoonfuls of copper carbonate; and two fluid ounces of ammonia.

This amount of copper carbonate is the equivalent of one-fourth ounce. It may be secured at any drug store, and should be about as coarse as granulated sugar. You can measure out two fluid ounces of ammonia by taking one-fourth of a half-pint bottle. Or you will probably find somewhere around the house a two-ounce or a four-ounce bottle. If you are in doubt, determine the matter by filling a pint Mason jar with the bottle you are to use. There are sixteen fluid ounces to the pint.

Place your copper carbonate in an empty quart jar, and pour your ammonia over it. Use just enough ammonia to dissolve it. This may take a little more or a little less, because ammonia varies in strength. Fill up the jar with water and allow any sediment to settle. Pour the clear, blue liquid into your spray-bucket, and add seven quarts of water, making eight quarts of the spray mixture in all.

Like Bordeaux, this fungicide deteriorates on standing, and should be made up fresh each time you want to spray.

FORMALIN

Where potatoes are scabby, or where onions are infested with smut, experience has shown that the trouble may largely be averted by seed treatment with a solution of formalin. Other materials are

sometimes used, such as quicklime or potassium sulfid. But the formalin treatment is effective and handy.

For Small Lots. Take two fluid ounces of formalin (this is the same as one-eighth of a pint) to four gallons of water. Immerse the uncut potatoes in this and let them remain for two hours. Then remove them, dry them a little and plant in scab-free soil.

For onion smut use two fluid ounces of formalin to four gallons of water. Sow your seed, but leave it uncovered in the drill. Then sprinkle the seed lying in the drill with the formalin solution, thus moistening slightly the ground just adjacent to the seed.

For grain smut use two fluid ounces of formalin to six gallons of water. Pour out your seed in a pile on the floor. Sprinkle it with the formalin solution enough to moisten all the grains. Let stand for three or four hours. Then spread out and dry before planting.

PARIS GREEN

The old standby for leaf-eating insects is Paris green. Time was when London purple was much used, but its composition was variable, and considerable amounts of free arsenic were often present, causing burning of the foliage. To-day arsenate of lead, which is considered in the next section, is replacing Paris green.

Standard Formula. Paris green may be used

simply stirred up in water; or it may be added to Bordeaux mixture. The proportions used are one pound of Paris green to one hundred and fifty or two hundred gallons of water or Bordeaux. When used in water, two or three pounds of lime are added.

In Small Quantities. Take a heaping teaspoonful of Paris green to three gallons of water or three gallons of Bordeaux mixture. This is the equivalent of one-fourth of an ounce.

If you use it in Bordeaux, no lime need be added. If you use it in water, add three heaping teaspoonfuls of lime.

ARSENATE OF LEAD

About the only difficulty with old-fashioned Paris green is the fact that it washes off readily. In the case of some vegetables, such as cabbages, this may be no disadvantage. We prefer to have the poison come off before the heads are marketed. As a rule, however, it is a distinct advantage to have a poison that will adhere through showers. Arsenate of lead will do this.

Standard Formula. Arsenate of lead is used at strengths varying all the way from three pounds to the hundred gallons up to twenty pounds to the hundred gallons. It depends on the power of resistance of the species of insect for which the spray is applied. There is no danger of burning the foliage.

In Small Quantities. This chemical comes in the form of a thick, sticky paste. For ordinary use take one tablespoonful, just slightly rounded, to one gallon of water or Bordeaux mixture.

This is the equivalent of one ounce of the paste. You may use double this amount if desired in the case of resistant insects, such as the potato beetle.

KEROSENE EMULSION

For most sucking insects, especially the soft-bodied ones, such as plant-lice or aphids, a satisfactory spray is to be found in kerosene emulsion. It is not a poison, and is of no avail against such insects as the potato beetle; nor is a poison spray like arsenate of lead of any use against the sucking insects for which kerosene emulsion is adapted. The distinction should be clearly understood. Kerosene emulsion is a contact remedy. Paris green and lead arsenate are stomach poisons.

Standard Formula. In making up this spray mixture on a large scale the proportions call for one-half pound of hard soap, one gallon of water, and two gallons of kerosene. The soap is dissolved in the hot water, the kerosene is added, and the spray-pump is used to churn the mixture violently.

In Making Small Amounts. Cut from a cake of common, hard soap a cube about one inch square. Take one-half pint of soft water; one pint of common kerosene, or coal-oil.

Pour the half-pint of water into any convenient vessel holding a quart or more, in which you can boil it. Shave the soap up fine and drop it into the water. Place the vessel on the fire, and bring the water to a boil, stirring to see that the soap is all dissolved.

Remove the vessel from the fire and, while the

soapy water is still hot, add the pint of kerosene. At once churn the mixture violently. For this purpose you may use a common egg-beater. It won't hurt the egg-beater in the least: you can easily wash it clean afterward with soap and hot water. Keep on churning the mixture for several minutes until you have a creamy mass of even consistency throughout.

This is your stock solution. For ordinary summer use you will take one part of this and add to it fifteen or twenty parts of water.

TOBACCO WATER

Concentrated extracts of tobacco are now on the market and are handy and effective against soft-bodied insects, such as the common plant-lice. They are prepared for use by simple dilution with water.

If waste tobacco stems are available, as they are apt to be in any town or city where the manufacture of cigars or stogies is carried on, you can make your own tobacco extract as follows:

Take any convenient vessel and pack the stems down in it moderately firm. Pour over them boiling hot water, just enough to cover them. Let this stand several hours. Then pour off the brown liquor, and dilute this as follows: one part of the brown extract to four parts of water.

SOAP SOLUTION

Most plants kept indoors develop sooner or later a crop of aphids, or some of the softer scales.

A satisfactory and handy spray or wash for these may be made by dissolving a block of ordinary toilet soap in water, and applying the solution with a small sprayer or simply by washing the plants with a rag or sponge.

To make the soap solution take a cube of white soap about an inch square or a trifle larger, shave it up fine, and dissolve in one gallon of warm, soft water.

PYRETHRUM IN WATER

Ordinary pyrethrum or "insect powder," if fresh, is of considerable value as a spray or wash for plants indoors. If stale, it is of practically no value whatever.

The strength generally used is at the rate of one ounce of the powder to two or three gallons of water.

For Small Quantities. Take one heaping teaspoonful of the pyrethrum and add it to two quarts of warm water. Allow it to stand for a while before use.

POISONED BRAN MASH

There is no garden pest more exasperating than the cutworm. Somehow, we can stand it to have the edge of a leaf chewed, but when the offender cuts the whole plant off even with the ground, leaving it there for our observation next morning, we draw the line.

Cutworms may be poisoned readily, if we give them a prepared bran mash to feed on just before we set out our plants.

Standard Formula. In large quantities the mash is made by taking fifty pounds of bran or middlings, two quarts of molasses and one pound of Paris green.

To Make One Quart. Take one quart of wheat bran or middlings. Mix with this one teaspoonful of Paris green, seeing to it that the poison is thoroughly distributed through the dry meal. Now, take half a cupful of water, and add to it one tablespoonful of molasses, or the equivalent in any other sweet. With this water moisten the bran slowly. Use more water if necessary until the bran is rather damp, but not wet.

This should be distributed in teaspoonful doses every two or three feet over the ground to be protected.

COMBINED MIXTURES

Combining two different poisons so as to make a double-headed application at one time is often a labor-saving device for the amateur. Thus, Bordeaux mixture can be used in place of water in the preparation of Paris green, and in this way we can get one spray that will kill fungous diseases and chewing insects at the same time. Similarly, lime-sulphur can be used in combination with arsenate of lead. (But a mixture of Paris green and lime-sulphur is injurious to the foliage.)

Probably you have some kind of a sprayer for this work. However, if you cannot justify the expense of one and cannot make some mechanical contrivance, still you need not despair. Follow

the example of your resourceful predecessors and use an old whisk broom. Insects and disease are rarely rampant in small gardens where care and neatness abide, but spraying, like weeding, is most effective when practised as a preventive. The use of spray mixtures gives you good practical experience too — which may come in handy someday.

What Bothers the Small Fruits

PLANT	INJURY	TIME	CAUSE	NAME	REMEDY OR PREVENTIVE	REMARKS AND CAUTIONS
Currant (1)	Leaves discolored	Spring and fall	Plant louse	Currant aphis	Kerosene emulsion	Apply early before leaves curl.
Currant	Leaves irregularly brown spotted	Spring	Reddish or yellow and black bug	4-lined plant bug	Kerosene emulsion for young	Burn egg-bearing currant tips.
Currant	Leaves stripped	Spring and summer	Spotted caterpillars	Currant worm	Poison or hellebore	Use hellebore after fruit is half grown.
Currant	Wilting tips	June	White borers	Currant stem borers	Burn infested tips	Cut well below affected part of cane.
Currant	Leaves brown spotted	Spring and summer	Fungus	Leaf blight	Ammoniacal copper carbonate	Bordeaux after fruit is picked.
Grape	Tips of shoots webbed	Summer	Whitish caterpillar	Grape plume moth	Crush caterpillars	Apply poison if pest is abundant.
Grape	Buds destroyed	Early spring	Green beetle	Steely flea beetle	Paint buds with poison	Spray with poison 10 to 14 days later.
Grape	Clusters wormy	Summer and fall	Small caterpillars	Grape berry moth	Spray with poison in June	Keep surroundings clear of brush and weeds.
Grape	Vines sickly, roots badly scored	Summer	Brown beetle and white grubs	Grape root worm	Poison foliage in June	Destroy pupæ by cultivation.
Grape	Light specked leaves	Summer	Whitish hoppers	Leaf hopper	Spray with whale-oil soap	Collect with sticky shields or other device.
Grape	Dark spotted shoots	Summer	Fungus	Anthracnose	Copper sulph. sol'n and Bordeaux	1st before buds open, 2nd 3 to 4 days later; burn diseased wood.
Grape	Whitish growth on leaves	Summer	Fungus	Downy mildew	Bordeaux	Spray when leaves are fully expanded.
Grape	Dark spotted fruit	Summer	Fungus	Black rot	Bordeaux. Ammoniacal cop. carb'te	1st to fully expanded leaves; after fruit sets in 2 to 3 wk. intervals till ¾ grown. Then 3d every 7 to 14 days.
Raspberry and Blackberry	Wilting tips	Spring	White maggot	Raspberry cane maggot	Poison ineffective	Cut and burn infested shoots.
Raspberry and Blackberry	Leaves riddled	Spring	Greenish larvæ	Blackberry sawfly	Poison or hellebore	Apply to expanded leaves and again 2 to 3 weeks later.
Raspberry and Blackberry	Stems gray, cracked	Summer	Plant disease	Anthracnose	Copper sulph. sol'n and Bordeaux	Cut and burn badly infested canes.
Raspberry and Blackberry	Orange-colored spots on leaves	Summer	Fungus	Red rust	Burn infested plants	Affection not amenable to treatment.
Strawberry	Newly set plants dying	Spring	Grub at roots	White grub	Dig out and destroy	Avoid setting plants on infested land.
Strawberry	Dead patches in bed	Spring and summer	Grub in crown	Crown borer	Destroy infested plants	Put new fields in another location.
Strawberry	Leaves blighted	Spring and summer	Fungus	Leaf blight	Bordeaux	Apply when growth begins, when fruit sets, and after fruiting.

(1) Currant is badly injured by San José scale (see fruit trees).

The Worst Pests of Our Orchard Trees

PLANT	INJURY	TIME	CAUSE	NAME	REMEDY OR PREVENTIVE	REMARKS AND CAUTIONS
*Apple (1)	Wormy fruit	Late summer and fall	Whitish caterpillar.	Codling moth	Poison, preferably arsenate of lead	Put in blossom end of apples within a week after bloom falls.
Apple	Irregular, hard or rotting trails in fruit	Summer and early fall	Small maggot	Railroad worm	Destroy infested fruits	Use early sweet varieties as traps and destroy promptly.
Apple	Young leaves and blossoms destroyed	Early spring	Caterpillars in cases	Casebearers	Poison young leaves	Spray tips of young leaves in badly infested orchards.
Apple	Young leaves and blossoms destroyed	Early spring	Brown caterpillar	Bud moth	Poison	Treatment as above.
Apple	Stripped branches with large tents	Early spring	Bluish caterpillar	Tent caterpillar	Poison	Remove and crush caterpillars when in nest.
Apple	Young leaves eaten or browned	Early spring	Looping caterpillars	Canker worms	Poison	Poison is preferable to the use of sticky bands.
Apple	Terminal leaves eaten, twigs with small, firm webs	Spring and fall.	Hairy caterpillars.	Brown-tail moth	Poison	Collect and burn winter nests.
Apple	Leaves brown and loosely webbed	Summer and early fall	Hairy, yellowish caterpillars	Fall web-worm	Poison	Remove nests and crush caterpillars.
Apple	Leaves stripped from branches	Summer and fall	Yellow or red marked caterpillars	Yellow-necked and red-humped worms	Poison	Crush clustered caterpillars.
Apple	Curled, sticky leaves	Early spring and summer	Plant-lice	Apple plant lice	Kerosene emulsion.	Spray early before leaves curl.
Apple	Dead limbs, red-spotted fruit	Spring to fall.	Gray and black bark louse	San José scale	Lime-sulphur wash, miscible oil	Spray before buds open in spring.
Apple	Poor growth, limbs scaly.	Spring and fall.	Brown scale insect.	Apple bark louse.	Kerosene emulsion.	Apply in early June when young are crawling.
Apple	Poor growth, limbs scurfy	Spring to fall	Whitish scale insect	Scurfy bark louse.	Kerosene emulsion.	Apply as above.
Apple	Poor growth, sickly foliage	Spring to fall.	A white, woolly plant louse	Woolly aphis	Kerosene emulsion or whale-oil soap.	Force insecticide through woolly covering.
Apple	Boring at base of tree	Spring and fall.	White legless grub.	Round-headed apple borer	Tar paper bands.	Band from May to July, cut out borers.
Apple	Leaves with thickened brown spots	Summer	Minute mite	Blister mite	Lime-sulphur wash or miscible oil	Spray before buds open.
Apple	Brown spots on leaf	Summer	Fungus	Leaf spot and scab	Bordeaux mixture.	Spray swelling buds a week before blossoms open; after they drop, and a week later.
Apple	Dead spots on bark	Growing season	Plant disease	Canker or blight	Burn infested parts	Cut well below infection to avoid carrying disease.
Cherry	Curled, sticky leaves	Early summer.	Black plant louse.	Cherry aphis	Kerosene emulsion.	Spray at 2 or 3 day intervals if necessary.
Citrus fruits, (orange, lemon, etc.)	Scaly fruit and limbs	Growing season	Circular scale	Red scale	Hydrocyanic acid gas	Fumigate at night, more effective than resin wash.

Citrus fruits..	Scaly fruit and limbs	Growing season	Long scale insect..	Purple or long scale	Fumigation.....	Treat as above.
Citrus fruits..	Scale on leaves and twigs.	Growing season	Black scale insect	Black scale.....	Fumigation.....	Treat as above.
Citrus fruits..	Blackened, sticky foliage.	Growing season	Small sucking insect	White fly.....	Fumigation.....	Treat as above.
Citrus fruits..	Yellow streaks on leaves.	Growing season	Minute mite.....	Red spider	Kerosene emulsion.	More injurious in dry seasons.
*Peach (2) ...	Bored trunks	Fall and spring	White caterpillars..	Peach borer	Dig out borers	Mound or band base of trees from June to September.
Peach	Buds destroyed	Early spring...	Small caterpillar...	Peach twig borer..	Lime-sulph. wash or kerosene emulsion	Spray before the buds open.
Peach	Shot holes in bark.....	Spring and summer	Small, black beetles	Fruit tree bark beetle.....	Burn the infested branches	Do this in winter or early spring.
Peach	Curled leaves.....	Summer	Plant disease.....	Peach leaf curl....	Lime-sulphur wash or Bordeaux.....	Apply before buds burst.
Peach	Sickly, yellowish trees....	Summer	Plant disease.....	Peach yellows.....	Cut and burn.....	Keep infected trees from contact with healthy trees.
Peach	Rotting fruit.....	Summer	Plant disease.....	Brown rot.....	Lime-sulph. wash or cop. sulph. solution	Apply before buds open.
*Pear (3)	Young fruit gnarly, maggoty	Spring	Yellowish maggot .	Pear midge	Destroy infested fruit	Use Lawrence pears as trap.
Pear.....	Skeletonized leaves.....	Summer	Slimy caterpillar ..	Pear slug.....	Poison or dust	Apply when slugs are abundant.
Pear.....	Leaves sticky, black	Spring and summer	Jumping louse....	Pear psylla	Lime-sulphur wash	Apply as for San José scale.
Pear.....	Brown foliage on dying branches.....	Summer	Bacterial disease ..	Pear blight	Cut and burn.....	Cut 6 to 10 inches below affected part.
*Plum	Crescent-shaped cuts in fruit	Spring	Small weevil.....	Plum curculio.....	Poison or collect ..	Jar daily or every few days for 2 to 3 weeks after fruit sets.
Plum	Brown scales on limbs ...	Fall and spring	Brown, oval scale..	Plum scale.....	Kerosene emulsion.	Spray after leaves fall and repeat before buds open.
Plum	Rotting fruit.....	Summer	Plant disease	Brown rot	Cop. sulph. solution and Bordeaux ..	Apply 1st before buds swell; and weak and repeatedly; ammoniacal cop. ca.b. after fruit sets.
Plum	Gnarly growths on limb ..	Summer and winter	Fungus	Black knot	Cut and burn.....	Apply Bordeaux in early spring.

(1) Apple: This tree is very badly injured by gypsy moth (see shade tree insects).
(2) Peach and plum are both badly injured by San José scale (see under apple).
(3) The pear suffers from codling moth, canker worm, brown tail moth, San José scale, and blister mite (see under apple).

*General treatment for orchard fruits: Apply lime-sulphur wash just before buds swell (for fungus, scale insects and blister mite); poisoned Bordeaux when young leaves appear (for bad infestations of casebearers, bud moth and early leaf feeders); repeat the latter within a week or ten days after the bloom falls (for codling moth, leaf feeders and fungus); give another application a week or 10 days later to insure thorough work. The same general directions apply to peach, pear, plum, and quince, the curculio affecting the latter being controlled in the same way as the plum curculio. The last two are very sensitive to arsenic.

PLANT	INJURY	TIME	CAUSE	NAME	REMEDY OR PREVENTIVE	REMARKS AND CAUTIONS
Asparagus	Shoots eaten	Spring and summer	Beetle and grub	Asparagus beetle	Poison grubs	Cut beds close, apply arsenate of lead to young plants.
Asparagus	Shoots rusted	Summer	Rust	Asparagus rust	Bordeaux in July and August	Set clean plants on uninfested land.
Bean	Leaves eaten	Summer	Grub	Bean beetle	Poison or kerosene emulsion	Use arsenate of lead; or the emulsion 1 to 8.
Bean	Stored beans wormy	All seasons	Black weevil	Bean weevil	Carbon bisulphide	Fumigate 24 hours in a tight vessel.
Bean	Leaves and pods spotted	Summer	Plant disease	Anthracnose	Bordeaux	Keep foliage covered with first appearance of disease.
Beet	Leaves spotted	Summer	Plant disease	Leaf spot	Bordeaux	When 4 or 5 leaves have opened, then 3 times at 10 day intervals.
Cabbage	Leaves lousy	Summer	Plant-lice	Cabbage aphis	Kerosene emulsion or whale oil soap	Spray when pests are numerous, repeating if necessary.
Cabbage	Holes eaten in leaves	Summer	Green caterpillars	Cabbage worm	Poison or hellebore	Hellebore is preferable after plants have headed.
Cabbage	Stems eaten off	Spring	Naked caterpillars	Cutworms	Band stems with paper	Use poisoned bait.
Cabbage	Wilting leaves	Summer	Red and black bug	Harlequin cabbage bug	Hand picking	Sow mustard early and kill bugs thereon with kerosene.
Cabbage	Roots destroyed	Early summer	White maggot	Cabbage maggot	Paper collars or dilute carbolic acid	Expose base of roots to drying sun for some hours.
Cabbage	Irregular, black spots on leaves	Summer	Bacterial disease	Black rot	Grow in clean soil.	Avoid infected soil if possible.
Celery	Yellowish spotted leaves	Summer	Fungus	Celery blight	Bordeaux	Grow in moist soil or in shady, dry situations.
Cucumber	Gnawed leaves	Summer	Black and yellow beetle	Striped cucumber beetle	Poisoned Bordeaux	Dust foliage with land plaster or ashes.
Cucumber	Mildewed leaves	Summer	Fungus	Downy mildew	Bordeaux	Apply every 10 days.
Onion	Wilting tops	Summer	White maggot	Onion maggot	Carbolic soap wash	Expose base of roots to drying sun for several hours.
Potato	Leaves eaten	Spring and summer	Beetles and grubs	Potato beetle	Poison or hand picking	Arsenate of lead is most effective.
Potato	Wilting stalks	Summer	Brown caterpillar	Stalk borer	Destroy infested stems	Rarely very injurious.
Potato	Black leaves	Summer	Plant disease	Potato blight	Bordeaux	Spray early and at 3-week intervals.
Potato	Scabby potatoes	Fall	Plant disease	Potato scab	Corrosive sublimate solution	Use 1½ oz. to 8 gals. water; plant in uninfected soil.

For the Vegetable Garden — *Continued*

PLANT	INJURY	TIME	CAUSE	NAME	REMEDY OR PREVENTIVE	REMARKS AND CAUTIONS
Squash	Wilting runners	Summer	Boring caterpillar	Squash borer	Slit stem and kill borer	Plant early trap vines.
Squash	Wilting leaves	Summer	Black bug	Squash bug	Hand picking	Trap under shingles.
Sweet potato	Leaves eaten	Summer	Small beetle	Flea and tortoise beetles	Arsenate of lead	Dip young plants in poison before setting.
Tomato	Yellow-specked leaves	Summer	Small beetle	Cucumber flea beetle	Poisoned Bordeaux	Feeds on a variety of plants.
Tomato	Leaves devoured	Summer	Large, green caterpillar	Tomato worm	Hand picking or poison	The latter is rarely necessary in the North.

The foregoing tables, together with the text of this chapter, tell you all you need to know about insect pests, plant diseases and the remedies for both in the small garden. The effects noted under "Injury" are not always the ultimate and most serious results, especially in the case of the diseases. But they are the first symptoms to be seen, and if you act promptly upon perceiving them, nine times out of ten you will prevent any further developments. Always view these enemies of the garden as an invading army. If they once gain possession of your stronghold, they wax marvelously numerous and powerful; if you put up preventive barriers and carry the war into their territory, before their forces have collected and begun their depredations, they will never gain a foothold. Watchfulness and spraying are cheap as preventives against the advance guard of the enemy; as a last resource, they are extremely expensive

Cornell College Library

INDEX

Note: The asterisk (*) indicates an illustration.

Ammoniacal copper carbonate, 182, 232
Amount of sash needed in garden, 114
of seed for 50 ft. row, 136
Annual cost of garden, 99
Anthracnose, bean, 171
April work, 162
Arsenate of lead, 235
Artificial watering, 190
Ashes, as a fertilizer, 225
to improve soil texture, 159
Asparagus, forcing, 33
how to cut,
knife, 178*
when to stop cutting, 186
bed, care of the, 157
how to make an, 157
in July, the, 192
salt on the, 157, 178, 192
soot for the, 189
August sowing, seeds for, 198
work, 196

Back fence, the real use for a, 29
Backyard garden, calendar of a, 59
Backyard, the redemption of a, 49
Bacteria, beneficial, how to increase the, 228
importance of, the, 227
in the soil, 215
Bagging grapes, 196
Barberry for a windbreak, 29, 59
Barrels, celery grown in, 40*
strawberries grown in, 39,40*
Bean anthracnose, 171
Bean poles, clothes poles as, 34
sunflowers for, 34
Bean strings, 46
Beans in coldframe, 125
when not to cultivate, 171
Beets in coldframe, 123
Berry boxes, old, how to use, 155*, 156
Berry bushes in the plan, 135
Blackberries, summer pruning, 196
Blanching celery with boards, 196
with earth, 197
Board, planting, 160
Boards, blanching celery with, 196
Bordeaux mixture, 231
Boys, and girls, and gardens, 85
Boys' garden, a, 86
plan of, 88*
yield of, 87
Brambles, pruning the, 149*, 150*, 196
spraying, 181
support for, 182*
tender, how to care for, 212
Bran mash, poisoned, 238
Brassicas, 80
Bush fruits, how to mulch, 211
how to plant, 161
Business man's garden, plan of, 45*

Cabbage, harvesting, 33
in coldframe, 130
Calendar, of a backyard garden, 59
of season's work: January, 134; Febuary, 148; March, 151; April, 162; May, 170; June, 182; July, 190; August, 196; September, 202; October, 204; November, 207

INDEX

Canadian wood-ashes, 31
Carbonate, ammoniacal copper, 182, 232
Carrots, in coldframe, 123
sprouting, 21
when to harvest, 185
Catalogues, 138
Cauliflower, in coldframe, 129
when to harvest, 184
Celery, blanching with boards, 196
blanching with earth, 197
grown in barrels, 40*
how to care for, 191
in the coldframe, 127
in the small garden storing, 209
liquid manure for, 198
outdoors, keeping, 205
storing for winter, 207*
trench, how to make a, 208
Chickens in the garden, 35
Children's gardens, 85
Clay soil, handling, 159
Clothes pole, as a bean pole, 34
vegetables and vines on, 30*, 34, 35*
Cloth sash for hotbeds, advantages of, 110
Clover as a fertilizer, 226
Coldframe as a greenhouse, a, 115
beans in the, 125
beets in the, 123
building the, 109*, 114
cabbage in the, 130
carrots in the, 123
cauliflower in the, 129
celery in the, 127
and hotbed, difference between, 106
eggplant in the, 124
gain made with a, 105
hardening-off seedlings in the, 119
how to prepare the, 117
leeks in the, 125
lettuce in the, 120
onion in the, 124
parsley in the, 126
peas in the, 131
peppers in the, 122
Coldframe, reasons for having a, 106
how to transplant in the, 119
spinach in the, 126
the management of a, 116
tomatoes in the, 121
ventilating the, 118*
watering, the, 118
Collars, paper, for seedlings, 177*
Combination planting, commercial methods of, 37
planting, crops for, 38
Combined spray mixtures, 239
Combining succession with rotation, 79
Commercial fertilizer, amount to use, 223, 225
fertilizer, rule for using, 224
fertilizers, how to use, 222
fertilizers, kinds of, 225
methods of combination planting, 37
Companion cropping, 36
Compost pile, how to make a, 201
Consumer coming into his own, 9
Coöperative vegetable growing, 65
Copper-carbonate, ammoniacal, 182, 232
Corn, how to prevent varieties mixing, 57
by June 20th, 19
sprouting, 20
the main crop, 172
Cost of garden, annual, 99
of tools, 144
Cover crop, in the garden, 204
rye as a, 202, 204
Cow manure, value of, 219
Cowpeas and soy beans, 226
Cropping, companion, 36
Crops for combination planting, 38
hurrying, 19
succession, a rule for, 176
Crop, corn the main, 172
Cultivate, how to, 171
when not to, beans, 171
Cucumber on clothes poles, 34
Cucurbits, 80
Cultivating potatoes, 193

INDEX

Currants, spraying, 181
Cutter, the strawberry runner, 180*
Cutworm, outwitting the, 90*, 177*, 210
  trenching the soil for the, 210

Diary, garden, 59, 92*
Dibbling, 154*, 155
Difference between coldframe and hotbed, 106
Distances for planting fruits, 147
  for planting vegetables, 102, 104, 136
  for thinning vegetables, 102, 179
Drilling, 163
Ducks in the garden, 35
Dwarf fruit trees, how to, 212
  supports for, 29

Earliest vegetables, the, 145
Early frosts, getting the best of, 204
  planting, 16, 17, 145
Earth, blanching celery with, 197
Economical thinning, 199
Economy in the garden, 16
Effect of soil sterilization, the, 227*
Eggplant in the coldframe, 124
Elements of plant food in fertilizers, 222, 225
England, seeds in, 139
Evergreens for a windbreak, 29
Expenses of ten-dollar garden, 58

Fall planting season, the, 213
February plantings, 149
  work, 148
Fertilizer, ashes as a, 225
  how much to use, 222, 225
  lime as a, 225
  salt as a, 225
  to use per square rod, 225
Fertilizers, clovers as, 226
  commercial, how to use, 225
Fertilizers, kinds of, 225
  rule for using, 224
  elements of plant food in, 222, 225
Fifty dollars from twenty-four tomato plants, 11
Five crops on one foot of ground, 70
Flat, 145, 146*
Forcing asparagus, 33
  rhubarb, 33
Formalin, 233
Fourth of July garden, a, 23
Fresh manure, the value of, 221
Frosts, early, getting the best of, 204
Fruit bushes, care of the first year, 180
  in the plan, 135
  garden, how to plant the, 160
  how to thin, 195
  distances for planting, 147
  varieties of, 147
  supports for dwarf, 29
  trees, how to dwarf, 212
Fruits, small, what bothers the, 241
  special requirements of, 147, 148
  spraying the, 190
  summer pruning of, 181

Gain made with coldframes, 105
Garden, a fourteen-year-old boy's, 86
  amount of sash needed in, 114
  annual cost of, 99
  backyard, calendar of a, 59
  diary, 59, 92
  ducks and chickens in the, 35, 36
  how to water the, 189
  invalid's, returns from an, 15
  line, 143*
  plan, the, 134
  planted after the 4th of July, a, 23
  record, a vest-pocket system of, 92
  records, the need of, 91
  small, storing celery in the, 209

INDEX

Garden, ten-dollar, a, 54
ten-dollar, plan of a, 55*
ten-minutes-a-day, a, 68, 71*
vegetable, pests of the, 244, 245
what your, can grow, 73
yield for one week, 69
28 x 28 ft., yield of, 51*, 53
40 x 45 ft., plan of, 60*
80 x 100 ft., yield of, 65
Gardens, boys, and girls, and, 85
Gardener's, reward, the thorough, 91
Gardener, what science has done for the, 49
Gather vegetables, when to, 183
Getting the best of the early frosts, 204
Girls, and boys, and gardens, 85
Good seed, 21, 139
Grapes, bagging the, 196
planting, 161
support for, 30
Grape vine, how to prune the, 212*, 213*
Greenhouse, a coldframe as a, 115
Green manures, 204, 226
Growing season, the busy, 170
Grow, what your garden can, 73

Hand weeders, 141*, 171*
Hardening off, seedlings, 110, 119
Harvesting cabbage, 33
Harvest, onions, how to, 200
Heat-lovers, 80
Heavy soil, how to dig, 211*
Henderson, Peter, quoted, 9
Hill, best, of potatoes, 22
how and when to, 178
Hoeing, value of, 14
Hoes, 142*, 172*
Hog manure, value of, 219
Home-made, hotbed mat, a, 111
pruning pole, 199*
Horse manure, value of, 219
Horse-weeds for pea brush, 64
Hotbed and coldframe, difference between, 106
Hotbed, cloth sash for, 110
cost of maintenance of, 17
how to build a, 107
mats, 111, 112*
sowing seeds in a, 109
transplanting seedlings in a, 148
usefulness of, 17
ventilating the, 118*
How and when to hill, 178
How much fertilizer to use, 222, 225
seed for 50-foot row, 136
seed to plant, 136
How to brush peas, 179
build a manure pit, 201
coldframe, 109*, 114
hotbed, 107, 108*
care for celery, 191
growing melons, 186
tender brambles, 212
cultivate, 171
cut asparagus, 178
dig heavy soil, 211*
light soil, 211*
dwarf fruit trees, 212
handle clay soils, 159
harvest onions, 200
rhubarb, 178*
increase the beneficial bacteria, 228
make a celery trench, 208
a compost pile, 201
ammoniacal copper carbonate, 232
an asparagus bed, 157
a rhubarb bed, 158
a root pit, 206
Bordeaux mixture, 231
hotbed mats, 111, 112*
kerosene emulsion, 236
liquid manure, 220*
poisoned bran mash, 238
soap solution, 237
tobacco water, 237
mulch the bush fruits, 211
pick melons, 192
plant bush fruits, 161
strawberries, 161
the fruit garden, 160

INDEX

How to prepare the coldframe, 117
prune brambles, 149*, 150*
the grape vine, 212*, 213*
sow seeds in the hotbed, 109, 117
store manure without loss, 201, 221
roots, 206
tell a ripe watermelon, 200
thin fruit, 195
transplant, 152, 153*
in the coldframe, 119
trim tomato vines, 193
use arsenate of lead, 235
commercial fertilizers, 222
formalin in the garden, 234
old berry boxes, 155*, 156
Paris green, 234
manure, 220
water the garden, 189
Humus, 219

Importance of bacteria, the, 227
of soil compactness in July planting, 27
Insects, trenching the ground to destroy, 204, 210
Intensive cultivation, 6
Invalid's garden, returns from an, 15
Invalid, what a garden did for an, 14

January work, 134
June work, 182
July planting, importance of soil compactness in, 27
planting, kinds of vegetables for, 24
what to sow in, 194
work, 190

Keeping celery outdoors, 205
seeds, 141
Kerosene emulsion, 236
Kinds and varieties, 139
of plant food, 225
Knife, asparagus, 178*
Kohlrabi, 83*, 85

Labels, 163*, 164*, 165*
Leaf-crops, 80
Legumes, 80
Leeks in coldframe, 125
Lettuce in coldframe, 120
Light soil, how to dig, 211*
Lime as a fertilizer, 225
Liquid manure, for celery, 198
how to make, 220*
Living, cost of, 4

Management of the strawberry bed, 181
the, of a coldframe, 116
Manure, 145
cow, value of, 219
fresh, value of, 221
green, 226
hog, value of, 219
horse, value of, 219
how to store without loss, 201, 221
to use, 220
liquid, for celery, 198
how to make, 220*
value of, 162, 219
what it does in the soil, 218
when to spread, 221
pit, how to build, 201
March, planting and transplanting in, 151, 152
March work, 151
May work, 170
Measuring rod, 143*
Melons, how to care for growing, 186
how to pick, 192
Mixtures, spray, combined, 239
Mulch, 27
bush fruits, how to, 211
for strawberries, 210
when to remove the, 211
winter, in the orchard, a, 202

INDEX

Nasturtium, soaking of, seed, 21
New Zealand spinach, 174
Nitrate of soda, for vegetables, 189, 191, 192
Nitrification, 215
Nitrogen, 222, 225
"Nitrogen-fixers," 216
Nodules, 216
November work, 207

October work, 204
One foot of ground, five crops on, 70
Onions, how to harvest, 200
  in the coldframe, 124
Orchard, pests, 242, 243
  winter mulch in the, 202
Outdoors, celery, keeping, 205

Paper, collars for seedlings, 177*
  pots, 155
Paris green, 234
Parsley in coldframe, 126
Pea brush, gathering, 144
  horse-weeds for, 64
Peas, how to brush, 179
  in the coldframe, 131
Peppers in the coldframe, 122
Perennial vegetables, in the plan, 135
  labels for, 164*, 165*
Pests of the orchard, 242, 243
  of the vegetable garden, 244, 245
Phosphoric acid, 225
Plan, berry bushes, in the, 135
Plan for a small vegetable garden, 101
  berries and fruits in the, 135
  of a boy's garden, 88
    business man's garden, 45
    ten-dollar garden, 55
    40 x 45 ft. garden, 60
  perennial vegetables in the, 135
  root crops in the, 135
  the garden, 134
Planning season, the, 133
Plant food, elements of, 222, 225
  sources of, 225
Plant early, 16, 145, 151
Planting and transplanting in March, 151, 152
Planting, board, 160*
  early, 16, 145, 151
  fruits, distances for, 147
  grapes, 161
  scheme, succession, 81
  February, 149
  season, the, 150
  season, the fall, 213
  tables for vegetable gardens, 102, 104
  vegetables, distances for, 102, 136
Plants, growing in a chicken brooder, 18
  tender, setting out, 176
Poisoned bran mash, how to make, 238
Portable trellis for tomatoes, 187
Potash, 222, 225
Potatoes, best hill of, 22
  cultivating and spraying the, 193
  for seed, 22
  in seven weeks, 20
  sprouting, 20*
  sprouting tray for, 21*
  when to plant early, 156
Pots, paper, 155
Preparing the soil, the importance of, 158*
Principles of seed sowing, 163
Privet for windbreak, 29
Profits and yields, 8
Profit, 600 per cent. from one-tenth of an acre, 92
  1,200 per cent. from 20 x 27 ft. of ground, 43
Prune the grape vine, how to, 212.* 213*
Pruning pole, home-made, 199*
Pruning, summer, of fruits, 181
  tomatoes, 58, 193
Pyrethrum, 238

Quart, amount of unpeeled tomatoes to a, 32

INDEX

Raspberries, summer pruning, 196
Record book, pages of, 93*
Records, garden, the need of, 91
  result of three years, 95
Redemption of a backyard, the, 49
Repairs and tools, 141
Requirements, special, of fruit, 147
Result of three years' records, 95
Returns from an invalid's garden, 15
Reward, the thorough gardener's, 91
Rhubarb, bed, how to make a, 158
  forcing, 33
  how to harvest, 178
Rolling the soil, 28
Root crops in the plan, 135
Root pit, how to make, 206
Roots, how to store, 206
Rotation, combining, with succession, 79
Row-marker, a, 170*
Rule for using commercial fertilizers, a, 224
Runner cutter, strawberry, 180*
Runners, strawberry, when to remove, 180
Rye as a cover crop, 202, 204

Salsify, 82, 85*
Salt as a fertilizer, 225
  on the asparagus bed, 157, 178, 192
Sash, amount needed in garden, 114
  cloth, advantages of, 110
Scarifier, 141*, 172*
Science, what, has done for the gardener, 49
Scuffle hoe, 172*
Season, of planting, the, 150
  the busy growing, 170
  the fall planting, 213
  the quiet, 207
  the planning, 133
Seed-bed, the, 159
Seed, how much, to plant, 136
  potatoes, for, 22
  sowing, in the hotbed, 109, 117
  vitality of, 98
Seedlings, hardening off, 110, 119
  paper collars for, 177*
  transplanting in hotbed, 148
Seeds, and yields for 50 ft., 136
  for August sowing, 198
  in England, 139
  keeping, 141
Seedsmen, 138
Seed sowing, the principles of, 163
September sowings, 203
  work, 202
Setting out tender plants, 176
Seven weeks, potatoes in, 20
Six hundred per cent. from one-tenth of an acre, 92
Small fruits, what bothers the, 241
Soaking of vegetable seeds, 21
Soap solution, 237
Soda, nitrate of, for vegetables, 189, 191, 192
Soil, bacteria in the, 215
  heavy, how to dig, 211*
  light, how to dig, 211*
  preparation, the importance of, 158*
  rolling the, 28
  sterilization, effect of, 227*
  trenching the, for cutworms, 204, 210
  what manure does in the, 218
Soot, for the asparagus bed, 189
Sources of plant food, the, 225
Sowing, August, seeds for, 198
  for succession, 166, 175
  seed in a hotbed, 109, 117
  September, 203
Soy beans and cowpeas, 226
Spading, value of, 61
Spinach, in coldframe, 126
  New Zealand, 174
Spraying brambles and currants, 181
  potatoes, 193
  the fruits, 190
Spray, mixtures combined, 239
  pump, 188*, 239
Sprouting, vegetables, 20, 21
  tray for potatoes, 21*
Square rod, fertilizer to use per, 225

INDEX

Sterilization, soil, effect of, 227*
Store, roots, how to, 206
Storing celery, for winter, 207*
  in the small garden, 209
Storing manure without loss, 201, 221
Strawberries grown in barrels, 39, 40*
  how to plant, 161
  mulching, 210
  yield per acre, 39
Strawberry bed, management of the, 181
  utilizing the, 38
  runner-cutter, 180*
  runners, when to remove, 180
Street sweepings, 16, 219
Succession, combining with rotation, 79
  crops, a rule for, 176
  planting scheme, a, 81
  sowing for, 166, 175
Summer pruning of blackberries and raspberries, 196
  of tree fruits, 181
Sunflowers for bean poles, 34
Support for, brambles, 182*
  dwarf fruit trees, 29
  grapes, 30
Sweet pea seed, soaking of, 21
Swiss chard, 84*, 85

Tank, washing, for vegetables, a, 183
Tender plants, setting out, 176
Ten-dollar garden, a, 54
  expenses of, 58
  plan of, 55*
Ten dollars, what one woman can do with, 54
Ten-minutes-a-day garden, a, 68, 71*
  yield of, 78, 79
Thinning, economical, 199
  vegetables, 179
Tobacco water, 237
Transplant in a coldframe, how to, 119
Transplanting, and planting in March, 151
Transplanting, in July, 191
  seedlings in hotbed, 148
  vegetables for, 136, 137
Tray, sprouting, for potatoes, 21*
Trellis, a simple, 47*
  for tomatoes, 30, 46
  portable, for tomatoes, 187
Trench, celery, how to make, 208
Trenching the ground to destroy insects, 204, 210
Trowels, 141*
Tomatoes, amount of unpeeled to a quart, 32
  in the coldframe, 121
  on clothes pole, 34
  one-fifth of a ton of, 31
  pruning, 58, 193
  trellis for, 30, 46
Tomato plants on single pole, 13*
  trellis, a portable, 187
  vines, how to trim, 193
    keeping over winter, 33
Ton, one-fifth of a, of tomatoes, 31
Tools, and repairs, 141*, 142*, 143* 154*, 170*, 171*, 172*
  cost of, 144
Twelve hundred per cent. profit from 20 x 27 ft. of ground, 43

Under-capitalization, 7
Usefulness of hotbed, 17

Value of, cow manure, 219
  fresh manure, 221
  hog manure, 219
  horse manure, 219
  manure, the, 162
  spading, 61
Varieties, and kinds of vegetables, 139
  of corn, how to prevent, mixing, 57
  of fruit, 147
Vegetable garden, pests of the, 244, 245
  plan for a small, 101*

INDEX

Vegetable gardens, planting tables for, 102, 104
Vegetable growing, coöperative, 65
Vegetables, distances for planting, 102, 136
for transplanting, 136, 137
nitrate of soda for, 189, 191, 192
the earliest, 145
distances for thinning, 179
varieties and kinds of, 139
washing tank for, a, 183
when to gather, 183
you can grow, 73
Ventilating the coldframe, 118*
Vest-pocket record garden system, a, 92
Vitality of seeds, 98

Washing tank for vegetables, a, 183
Watering, artificial, 190
the coldframe, 118
Watermelon, how to tell a ripe, 200
Week, yield of garden for one, 69
What bothers the small fruits, 241
certain plants like best, 217
manure does in the soil, 218
to sow in July, 194
your garden can grow, 73
When, and how to hill, 178
to gather vegetables, 183
plant early potatoes, 156
remove the mulch, 211
spread manure, 221
Windbreak, 29, 59
Winter, keeping tomato vines over, 33
mulch in the orchard, a, 202
storing celery for, 207*
Woman, what one, can do with $10, 54
Wood-ashes, Canadian, 31
Work, April, 162; August, 196; February, 148; January, 134; July, 190; June, 182, March, 151; May, 170; November, 207; October 204; September, 202

Yield of boy's garden, 87
garden for one week, 69
strawberries per acre, 39
ten-minutes-a-day garden, 78, 79
28 x 28 ft. garden, 53
80 x 100 ft. garden, 65
Yields, and amount of seed for 50 feet, 136
and profits, 8

THE END

THE COUNTRY LIFE PRESS
GARDEN CITY N. Y.

THIS BOOK MAY BE KEPT

Fourteen Days

and may be renewed once for the same time. The term expires on the date last stamped below. The fine for keeping it overtime is **Two Cents a Day**, Sundays and Holidays included.

APR 14 '44
MAR 27 '50
MAY 21 '51
5/6/57
MAR 28 1972
APR 6 1972
MAY 15 1975

~~635~~
~~Se 9g~~

13956

GOSHEN COLLEGE
LIBRARY

Books, except those used for reference, may be kept **Fourteen Days** and may be renewed once.

A Fine of Two cents will be charged for each day overtime.

Books lost or damaged must be paid for by the borrower.

SB
321
S5